Control Panel Installation Guide

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Introduction

The Control Panels and modules supplied by *Control Panel Designs* form a complete solution for controlling turnouts and other devices on a model railroad. The aim of the solution is to:

- Provide an aesthetically pleasing interface for viewing track routes and controlling turnouts.
- Reduce the complexity of wiring turnouts to control panels.
- Provide flexibility by using a system of interconnected intelligent modules.
- Provide scalability by catering for the smallest and largest layouts of all scales.

The solution is based on custom made control panels that are mounted on or near a model railroad, and connected to turnout motors via a system of 'off-the-shelf' modules. An iPad app can also be used as the control panel interface, either in conjunction with physical control panels, or without them.

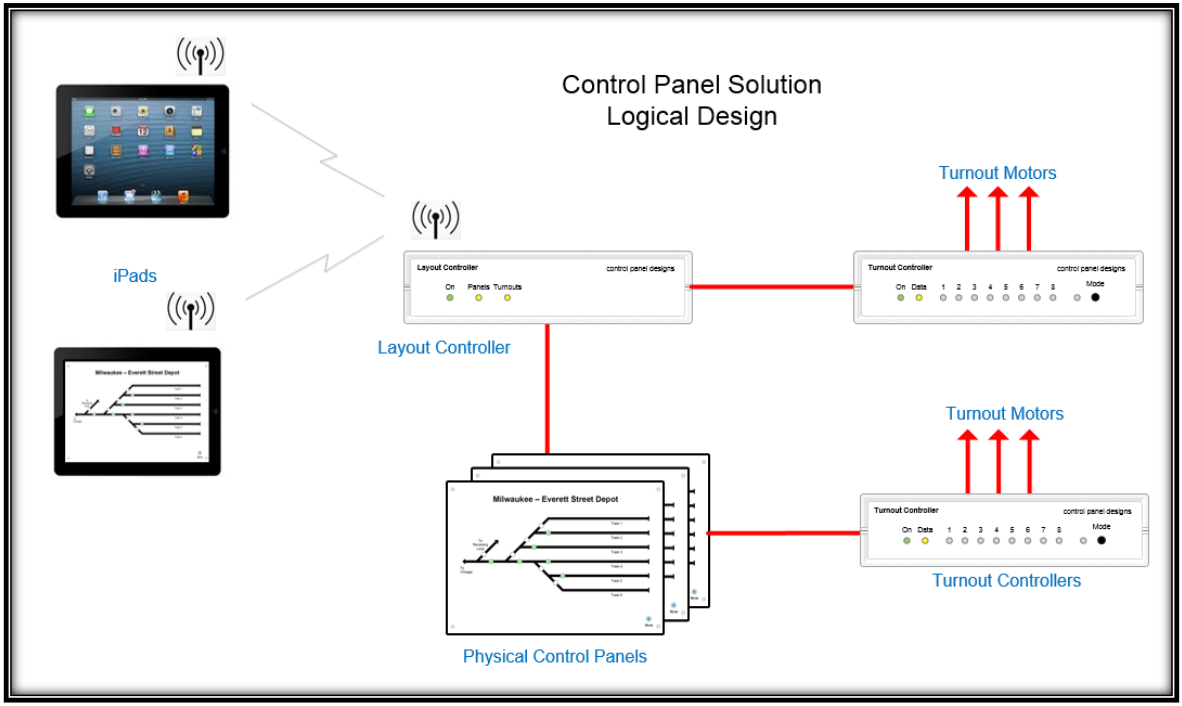
This document is the installation and user guide for control panel solutions manufactured and sold by *Control Panel Designs.* The information and procedures in this document relate to the following modules:

- Control Panel
- Turnout Controller
- Layout Controller

It is recommended that you read this document prior to attempting to install or configure any of the modules. The Control Panel and modules that you have purchased need to be installed on the layout, provided with power, and connected to turnout motors before the solution can become fully operable. The following chapters provide the information and procedures needed to successfully install and operate the Control Panel so that turnouts can be remotely controlled. Further product information can be found on the Control Panel Designs web site. www.controlpaneldesigns.com

High Level Design

The following diagram illustrates, at a high level, how the solution components are connected together. Control Panels are connected together, and to the Layout Controller, with RJ45 Ethernet cables. Turnout Controllers are connected to either the Layout Controller or to any of the physical Control Panels. iPads connect to the Layout Controller via Wi-Fi.



Modules and Components

Physical Control Panel

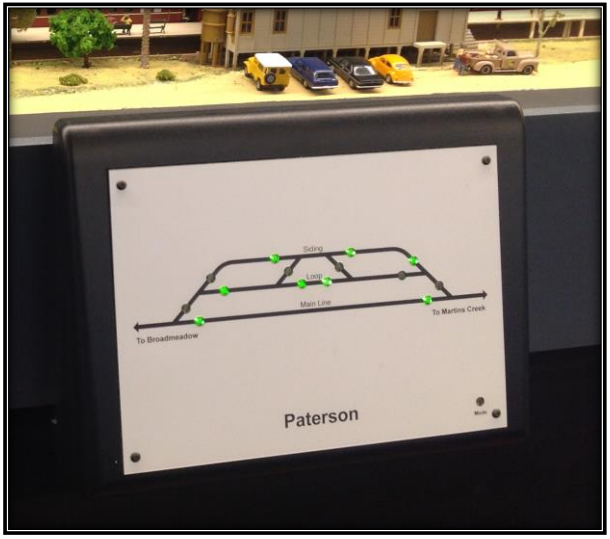


Figure 1 Physical Control Panel mounted on a layout

The Physical Control Panel is the user interface for controlling turnout motors. Operators select routes for trains by pressing tactile switches protruding through the fascia of the control panel.

A track schematic diagram is laser engraved into the control panel fascia. The tactile switches are aligned with the track schematic diagram and associated with turnout motors on the model railroad layout. The tactile switches contain built-in green LEDs that indicate which way the turnouts are set.

Typically, a turnout has two tactile switches with built in LEDs. One switch is lit, showing the currently set route. The other switch is not lit. (See photo on this page).

Operators press non-lit switches to select routes for trains. Some turnouts, such as double track crossovers are combined for control purposes, such that one tactile switch can be used to set two opposing turnouts simultaneously. This simplifies the design of the track schematic, and makes operation easier. The Physical Control Panel can be mounted on the fascia of the layout, or placed on a table or bench ‘keyboard’ style.

Physical Control Panel Specifications

Dimensions	External Dimensions of enclosure: (200mm x 280mm 76mm) or (7.9” x 11” x 3”) Size of Control Panel Fascia: (233mm x 164mm) or (9.2” x 6.5”) Enclosure is constructed of ABS 94HB Plastic
Power	Customers are required to provide their own source of AC or DC Power. Power required is 15V AC or 24V DC rated at 200mA or better. Control Panel includes 2.1mm DC Jack where centre pin is positive.
Cabling	Is connected to other modules with RJ45 cables. Standard CAT5 Ethernet cables can be purchased or constructed. Rear of Panel has two female RJ45 connectors for connection to the Layout Controller and Turnout Controllers.
Mounting	Can be mounted flat on a table layout, or mounted vertically on a layout fascia.

iPad App

Control Panel Designs has developed an iPad app for use with our control panel system. Customers who order Physical Control Panels also get the option to control the same devices on the layout with the iPad app.

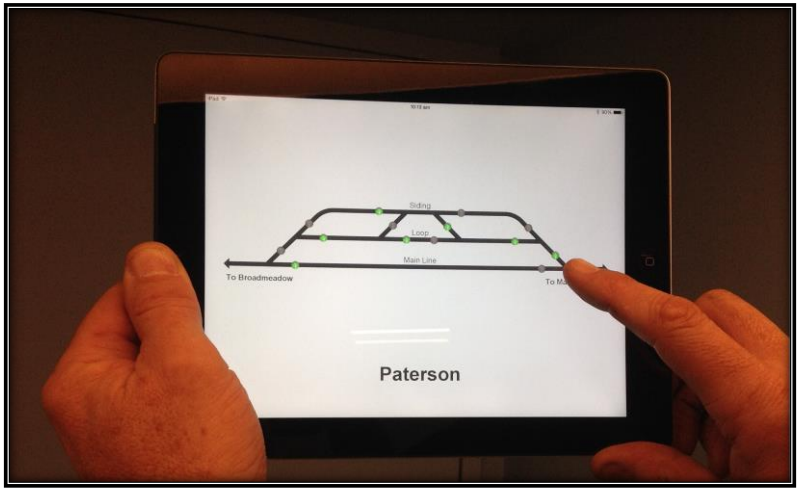


Figure 2 iPad app being used to control turnouts

Customers download the app from the Apple App Store. The name of the app is “Layout Control”. Once the app is downloaded customers connect with Wi-Fi to our Layout Controller and use the iPad app to operate virtual control panels.

Customers can choose to use only iPad based control panels, OR use iPad based control panels in addition to Physical Control Panels. Both physical and virtual panels operate in exactly the same way albeit that the iPad control panels have virtual tactile switches in the user interface, compared with physical tactile switches mounted on the physical panel.

Once purchased there is no limit to the number of iPads that are used to control the layout. Visitors to the layout can bring their own device, download the FREE app, and connect to the Layout Controller, and start using the panels.

Layout Controller

Each solution requires one Layout Controller. The Layout Controller is the 'brains' of the solution. It is where the processing of instructions takes place. The Layout Controller is connected to Physical Control Panels and Turnout Controllers via two RJ45 bus connectors. One bus is for Control Panels, and one bus is for Turnout Controllers.

Figure 3 Front view of Layout Controller

The Layout Controller also emanates a Wi-Fi network to enable iPads to connect to it for the purposes of controlling turnouts and other devices. When the iPad app is opened by the user it connects to the Layout Controller and loads the virtual control panels into the iPad app. Operators can swipe between panels and press switches on the virtual control panels to change turnouts and other devices.

Other features and functions will be added to the Layout Controller moving forward. Customers will be able to upgrade the firmware within the Layout Controller in the future to take advantage of new features. Please see our website or Facebook page for more information on future features. http://controlpaneldesigns.com

Layout Controller Specifications

Dimensions	External Dimensions of enclosure: 140mm (W) x 110mm (D) x 35mm (H) or 5.5” (W) x 4.3” (D) x 1.4” (H) Enclosure is constructed of high impact ABS Plastic.
Power	Customers are required to provide their own source of AC or DC Power. Power required is 15V AC or 24V DC rated at 200mA or better. Control Panel includes 2.1mm DC Jack where centre pin is positive.
Cabling	Is connected to other modules with RJ45 cables. Standard CAT5 Ethernet cables can be purchased or constructed. Rear of Layout Controller has two female RJ45 connectors for connection to Control Panels, and one female RJ45 connector for connection to slow motion Turnout Motors.
Mounting	Shelf mounted, typically under the layout. Or, can be mounted vertically using customer supplied adhesive Velcro tape strips or double-sided mounting tape.

Turnout Controller

Turnout Controllers are used to control various types of turnout motor. They accept instructions from the Layout Controller to change turnouts on the model railroad.

When an operator presses a tactile switch on the control panel, messages are sent to the Layout Controller, and then to the appropriate Turnout Controller with instructions for which turnout needs to be changed. The state on the related turnout controller port for that turnout is then changed.

Figure 4 Turnout Controller

Most commonly available turnout motor types are supported. Those that have been tested with the Turnout Controller are:

- **Slow Motion** Turnout Motors - (Stall Motors) such as Tortoise by Circuitron, and Cobalt by DCC Concepts
- **Solenoid Based** Turnout Motors such as Peco, Bachmann and Atlas
- **Polarity based Solenoid** Turnout Motors such as Kato

In the case of slow motion turnout motors, the polarity is changed, causing the motor to change the turnout.

In the case of solenoid based turnout motors, the solenoid is actuated, causing the motor to change the turnout.

Turnout Controller Specifications

Dimensions	External Dimensions of enclosure: 140mm (W) x 110mm (D) x 35mm (H) or 5.5” (W) x 4.3” (D) x 1.4” (H) Enclosure is constructed of high impact ABS Plastic.
Power	Customers are required to provide their own source of AC or DC Power. Power required is 15V AC or 24V DC rated at 200mA or better. Control Panel includes 2.1mm DC Jack where centre pin is positive.
Cabling	Is connected to other modules with RJ45 cables. Standard CAT5 Ethernet cables can be purchased or constructed. Rear of Panel has two female RJ45 connectors for connection to Control Panels, and two female RJ45 connectors for connection to slow motion Turnout Motors.
Mounting	Shelf mounted, typically under the layout. Or, can be mounted on vertically using customer supplied adhesive Velcro tape strips or double-sided mounting tape.

Wiring Adapter (Stall Motors and Kato ONLY)

The Wiring Adapter is used on conjunction with slow motion turnout motors, and Polarity based turnout motors (Kato) ONLY. The Wiring Adapter has an RJ45 connector and an 8 pin terminal block (4 x pairs of wires). Slow Motion Turnout Motors, and their equivalents, are each connected to one pair of terminals on the terminal block, which relates to a specific port on the Turnout Controller.

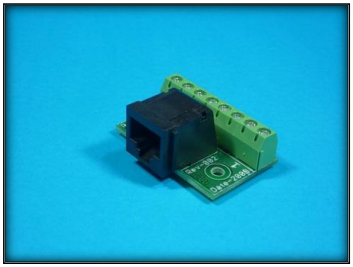


Figure 5. One side of the Wiring Adapter showing RJ45 connector

The Wiring Adapter aggregates these four pairs of wires emanating from four turnout motors into one Ethernet connector on the Wiring Adapter. The Ethernet connector is used to connect the Wiring Adapter to the Turnout Controller via an RJ-45 (Ethernet) cable. In this way Wiring Adapters can be located near clusters of turnout motors (typically four) to aggregate and thus reduce the amount of wiring.

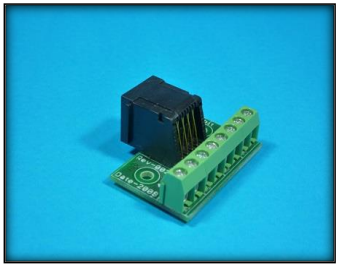


Figure 6. The other side of the Wiring Adapter showing the 8 pin terminal block

Wiring Adapter Specifications

Dimensions	40mm (W) x 25mm (D) x 20mm (H) or 1.6” (W) x 1.0” (D) x 0.8” (H).

Cabling	Is connected to Turnout Motor Controller with RJ45 based (Ethernet) cable. Standard CAT5 Ethernet cables can be purchased or constructed.
Mounting	Two mounting holes are provided to allow fixing of the adapter in close proximity to turnout motors.

Installation

Installation of your solution can be summarised with five steps:

1. Locating Components on your layout
2. Applying Power
3. Connecting Modules together
4. Connecting Turnout Motors to modules
5. Using the iPad app

1. Locating Components on your layout

Each module needs to be located in a specific location on, under, or near your model railroad. This section documents considerations for locating your modules on the layout.

The adjacent diagram illustrates an example location of control panels and modules on a model railroad layout.

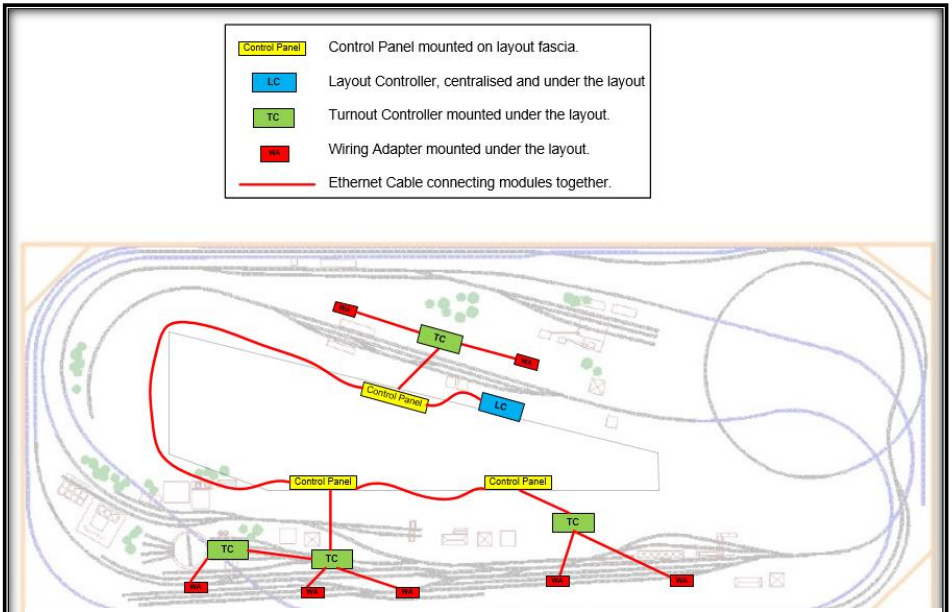


Figure 7. Example locations of Control Panels and Modules on a Model Railroad

You will note that there is one Control Panel bus that runs around the layout connecting the control panels.

Typically, Turnout Controllers are then connected to the nearest control panel. But they can also be connected to the Layout Controller if that is more convenient. When using stall motors Wiring Adapters are located near a corresponding Turnout Controller to aggregate four turnout motors into one cable.

Locating the Layout Controller

The Layout Controller is the central component of the solution. The Layout Controller is a termination point for the Panels and Turnout control buses used by the solution. A Wi-Fi router is included within the Layout Controller so that iPads may connect to it. As such there are special considerations when locating the Layout Controller.

When locating the Layout Controller the following points should be considered:

- Locating the Layout Controller close to a Physical Control Panel or other modules will reduce the length of cables required.
- Being WiFi enabled it is preferred that it be located in a central position, if possible.
- Being WiFi enabled means that it should not be overly obstructed or blocked. A clear area should be maintained around it so that wireless radio signals can propagate throughout the room.
- The Layout Controller should be located at one end of the control panel bus. If the end of the bus is not in a central position, then it is recommended that a longer Ethernet cable is used to extend the Layout Controller to a more central position.

Locating Physical Control Panels

Physical Control Panels are the user interface of the solution. The track schematic on the control panel relates to sections of track in one or more locations on your layout. Considerations for locating a control panel are:

- Generally, the control panel should be located as close as possible to the sections of track it can control.
- Control panels should be mounted at a height that allows for the easiest operation by users.
- Ideally, Control panels should be located in a central position relative to the track it controls.
- Control Panels should NOT be located in places where operators or objects will accidentally bump and damage the panel.
- Access to the rear or underside of the panel (depending on orientation) is required for power cables and Ethernet cables.
- Avoid allowing the top of the control panel to be above the top of the layout fascia, as it can impact viewing or photography in the future.
- Most customers attach Physical Control Panels to the layout fascia with Velcro. However, a special optional mounting bracket is also available.

Locating Turnout Controllers

Turnout Controllers are the motor drivers for the control panel solution. Each port on the Turnout Controller is mapped to tactile switches on the control panel, and connected to a turnout motor on the layout. Provided with your control panel solution is a port mapping diagram. The port mapping diagram illustrates which turnout motor is connected to which turnout controller, and which port on the turnout controller.

For slow motion turnout motors a Wiring Adapter is used to aggregate four turnout motors to one Ethernet cable. Solenoid based Turnout Motors are connected directly to a terminal block on the turnout controller.

The following guidelines should be used when locating your turnout controller:

- Turnout controllers should be located between the control panel and the cluster of turnout motors they control.
- Generally, turnout controllers should be located closer to the turnout motors to simplify wiring, as they are connected to the control panel via single RJ45 based Ethernet cable.
- Turnout controllers should be located such that the cabling required for connection to a control panel or adapter is as short as possible.

Locating Wiring Adapters

Wiring Adapters are only required for slow motion turnout motors like Tortoise and Cobalt. Due to the low current requirements of slow motion turnout motors standard Ethernet cables with RJ45 connectors on each end can be used to aggregate connections.

Wiring Adapters are connected to the Turnout Motor Controller via an RJ-45 (Ethernet) cable. Each RJ-45 connection supports four turnout motors. The following guidelines should be used for locating adapters:

- As each adapter supports four turnout motor connections it should be located as close as is practical to a cluster of four turnout motors.
- Each wiring adapter should be located in a position relatively central to all four turnout motors.
- Screw holes are available on the Wiring Adapter for mounting purposes.

2. Applying Power

The control panels, and each of the provided modules except the Wiring Adapter, require electricity to operate. Due to the various electrical standards used across the world, and the impact of heavy power supplies on the cost of shipping, *Control Panel Designs* does not provide power supplies. Rather, each customer is required to source power supplies within the country of use. We do however provide the appropriate DC plug to be used with your power supplies.

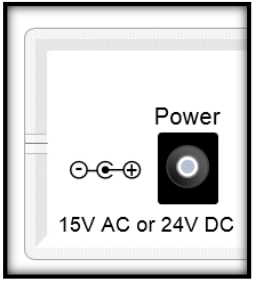


Figure 8 Power Input Jack with labelling

Multiple panels and/or modules can be powered from common power supplies. However, this will depend on the specifications of AC or DC power supplies used, and the amount of current required by each module.

The table below lists the power requirements information for each module. Please also refer to the power supply input jack, and it's associated labelling on the rear of each supplied module. The labelling indicates the polarity of the connectors within the jack.

Table 1 Power Requirements for Control Panels and Modules

Module Name	DC Input Voltage	Minimum Current	Power Connection
Physical Control Panel	15V AC or 24V DC	> 200mA	2.1mm DC Jack
Turnout Controller	15V AC or 24V DC	> 200mA	2.1mm DC Jack
Layout Controller	15V AC or 24V DC	> 200mA	2.1mm DC Jack
Wiring Adapter	n/a	n/a	n/a

3. Connecting Modules Together

Physical control panels, Turnout Controllers and the Layout Controller need to be connected together via standard Ethernet cable using RJ45 connectors. iPads connect to the Layout Controller via Wi-Fi.

The Ethernet cables are used to form two control buses used with the solution:

1. Panels Bus
2. Turnouts Bus

Control Panels are connected to the Layout Controller via the Panels Bus.

Turnout Controllers are connected to the Layout Controller via the Turnouts Bus, either connected directly to the Layout Controller, or connected to a local Control Panel.

iPads are not physically connected to the Layout Controller, rather, they use WiFi to connect.

Where there are multiple control panels, or multiple turnout controllers, they can be daisy chained together on a single, non-looped, communication bus using Ethernet cables. Please note that the communication bus formed with Ethernet cables is a “bus”, and not a “loop” or “ring”.

Do not connect the ends of the bus together!

Ethernet Cables

Customers need to acquire '*off-the-shelf*' Ethernet cables to connect control panels and modules together.

- An Ethernet Cable is made of Category 5 or Category 6 twisted pair cable, and has a Male RJ-45 connector on each end. They are ordinarily used to connect computers and printers to Ethernet networks.
- Ethernet Cables can be purchased in various lengths from electronic and computer stores.
- Ethernet Cables can also be constructed to exact length by crimping RJ-45 connectors on Category 5 or Category 6 cable.

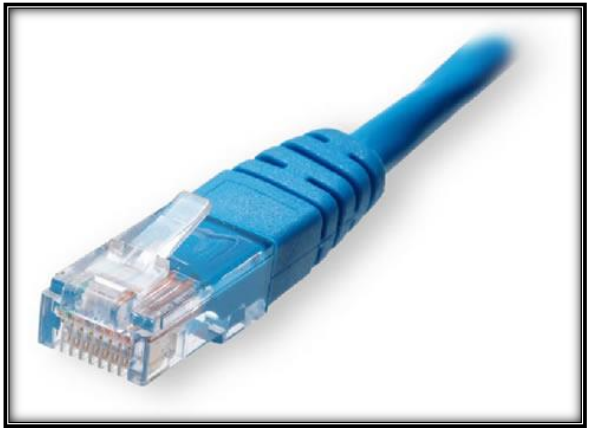


Figure 9. RJ45 Connector on Cat 6 Ethernet Cable

Step 1 – Connecting Physical Control Panels to the Layout Controller

Acquire the appropriate length Ethernet cable that will be used to connect the Layout Controller to the first Physical Control Panel, noting that the Layout Controller is positioned at one end of the control panel bus, or the other.

It is recommended that if acquiring new cables, select one colour cable for the Control Panels and another colour for the Turnout Controllers and another colour for Wiring Adapters.

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1. Plug one end of the Ethernet cable into the *"Panels"* bus on the Layout Controller, and plug the other end of the Ethernet cable into *"Communications In"* on the underside of the Control Panel.
2. Now run a second Ethernet cable from *"Communications Out"* on the first Control Panel, and connect it to *"Communications In"* on the second Control Panel.
3. Repeat this step for subsequent Control Panels until all are connected to the *"Panels"* bus.

Figure 10 Rear of Layout Controller

Figure 11 Underside of Physical Control Panel

Step 2a – Connecting Turnout Controllers to the Layout Controller (Optional)

Where Turnout Controllers are located in close proximity to the Layout Controller they can be connected directly to the *"Turnouts"* bus. Acquire the appropriate length Ethernet cable that will be used to connect the first Turnout Controller to the Layout Controller.

It is recommended that if acquiring new cables, select one colour cable for the Turnout Controllers and another colour for the Control Panels.

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1. Plug one end of the Ethernet cable into the *"Turnouts"* bus on the Layout Controller, and plug the other end of the Ethernet cable into *"Communications In"* on the rear of the Turnout Controller.
2. Then run a second Ethernet cable from *"Communications Out"* on the first Turnout Controller, and connect it to *"Communications In"* on the second Turnout Controller.
3. Repeat this step for subsequent Turnout Controllers until all are connected to the *"Turnouts"* bus.

Figure 12 Rear of Layout Controller

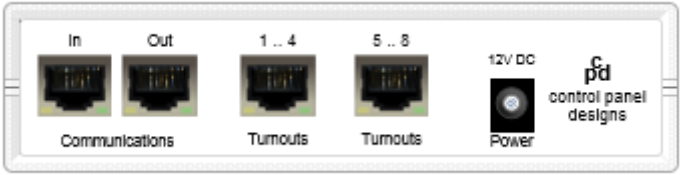

Figure 13 Rear of Turnout Controller

Step 2b – Connecting Turnout Controllers to the local Control Panel (Optional)

Where Turnout Controllers are located in close proximity to the Control Panels they can be connected directly to the *"Local Modules"* bus on the local control panel. Acquire the appropriate length Ethernet cable that will be used to connect the first Turnout Controller to the local Control Panel.

It is recommended that if acquiring new cables, select one colour cable for the Turnout Controllers and another colour for the Control Panels and Wiring Adapters.

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1. Plug one end of the Ethernet cable into the *"Local Modules"* bus on the Control Panel, and plug the other end of the Ethernet cable into *"Communications In"* on the rear of the Turnout Controller.
2. Then run a second Ethernet cable from *"Communications Out"* on the first Turnout Controller, and connect it to *"Communications In"* on the second Turnout Controller.
3. Repeat this step for any subsequent Turnout Controllers, until they are all connected to the local Control Panel.

Figure 14 Rear of Turnout Controller

Figure 15 Underside of Physical Control Panel

4. Connecting Turnout Motors to modules

Step 3 – Connect Wiring Adapters to Turnout Controllers (Slow Motion and Kato ONLY)

This step is only required for slow motion turnout motors such as Tortoise or Cobalt, as well as Kato turnouts. The following diagram illustrates how to connect the wiring adapters to a Turnout Controller when using slow motion turnout motors, or Kato turnouts.

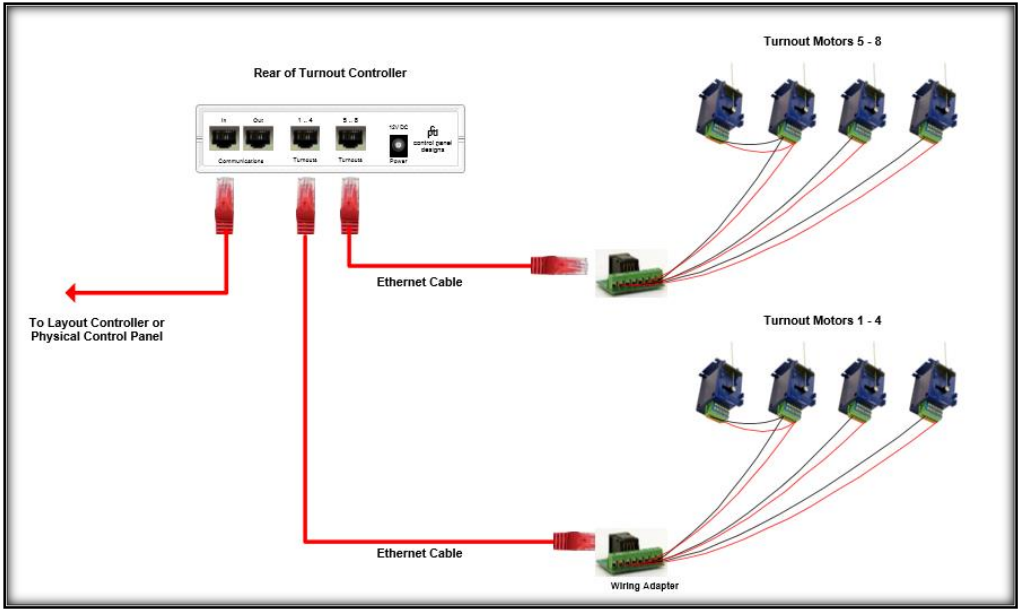


Figure 16 Connectivity using stall motor based Turnout Motors

Step 4a – Connecting Turnout Motors to Wiring Adapters

This step is only required for slow motion turnout motors such as Tortoise or Cobalt, as well as Kato turnout motors.

The Wiring Adapter aggregates four slow motion turnout motors (one pair of wires per turnout motor) into one RJ-45 female connector.

The Wiring Adapter is connected to the Turnout Motor Controller via an Ethernet Cable.

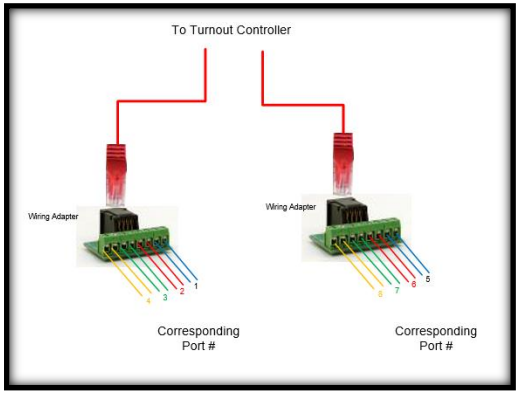


Figure 17. Wiring Adapter port mapping

Use a pair of light gauge wires to connect the + and − terminals of a given turnout motor to two terminals on the Wiring Adapter.

The Wiring Adapter has eight terminal connection points, providing for four turnout motors. Each pair of connection points relates to one turnout motor. The numbering convention used for turnout motors on the Wiring Adapter is as per the following diagram.

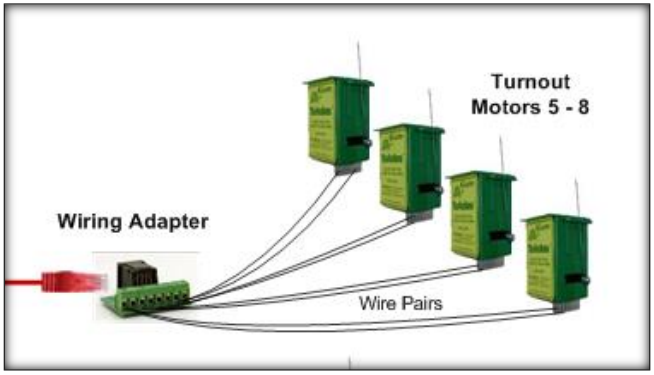


Figure 18 Connectivity of slow motion turnout motors to the Wiring Adapter

Slow motion turnout motors are operated by changing the polarity of the two connected wires. The Wiring Adapter makes wiring easier by aggregating up to 8 wires (two for each of the four turnout motors) into one RJ-45 connector that is

used to connect the adapter to the Turnout Motor Controller.

Locating the Wiring Adapter as close as possible to a cluster of turnout motors reduces the amount of untidy wiring, as only one Ethernet cable is required to connect the Wiring Adapter back to the Turnout Controller.

N.B. *If you find that after connecting the Turnout Motor that it operates in the wrong direction simply reverse the pair of wires either at the wiring adapter, or at the turnout motor to change the assigned polarity.*

Step 4b - Connecting Solenoid based Turnout Motors to the Turnout Controller

This step is only required for solenoid based turnout motors such as Peco, Bachmann, Life Like, or Atlas.

The Turnout Controller can support 8 solenoid based turnout motors that are connected with three wires each to the terminal blocks on the rear of the controller. The three wires represent *"Right", "Left",* and *"Common".*

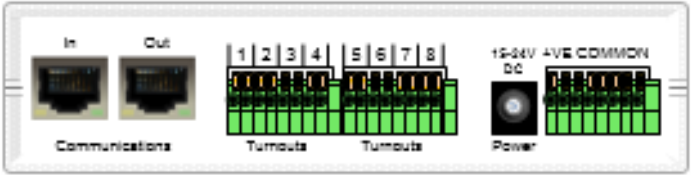


Figure 19 Rear view of Turnout Controller used with Solenoid based motors

Solenoid based turnout motors are operated by discharging stored energy in capacitors to 'fire' the solenoid in one direction, or another (Left or Right). The Turnout Controller makes wiring easier by aggregating the high current requirements of each solenoid into one module that manages the charging and discharging of capacitors. The Turnout Controller only requires one power source for all eight solenoids motors.

For connecting Solenoid based turnout motors to the Turnout Controller we recommend using wire of similar characteristics to 14/0.20 wire (14 strands of 0.2mm diameter).

This wire size is typically rated to carry 4.5A. This would be fine for lengths up to 5 metres in distance from the Turnout Controller. If there is a need for a greater wire length then 24/0.20 is recommended.

Each solenoid based turnout motor is connected to one of the eight ports on the rear of the Turnout Controller. Please refer to the solenoid turnout motor manufacturer's document on how to terminate those wires on the turnout motor.

To terminate the turnout motor wires on the turnout controller use the following procedure:

1. Insert a pointed needle like tool into the orange lever.
2. Insert the wire into the corresponding hole.
3. Release the orange lever.

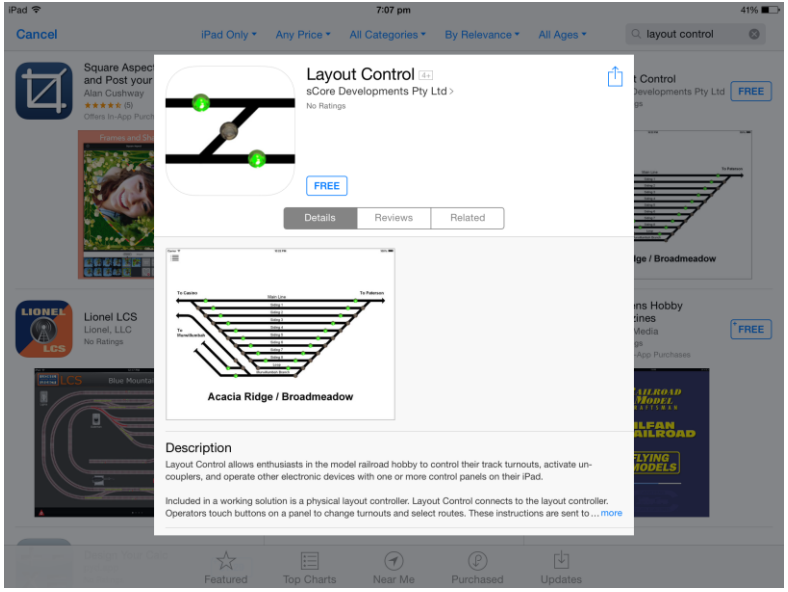
N.B. If you find that after connecting a Turnout Motor that it operates in the wrong direction simply reverse the wires connected to "R" and "L" to change the assigned direction.

Each turnout motor needs to be wired to a specific Turnout Controller, and Turnout Controller port. The mapping of your turnout motors to Turnout Controller ports is provided with your solution when it ships from *control panel designs.* Please refer to that diagram to know which port to connect each turnout motor.

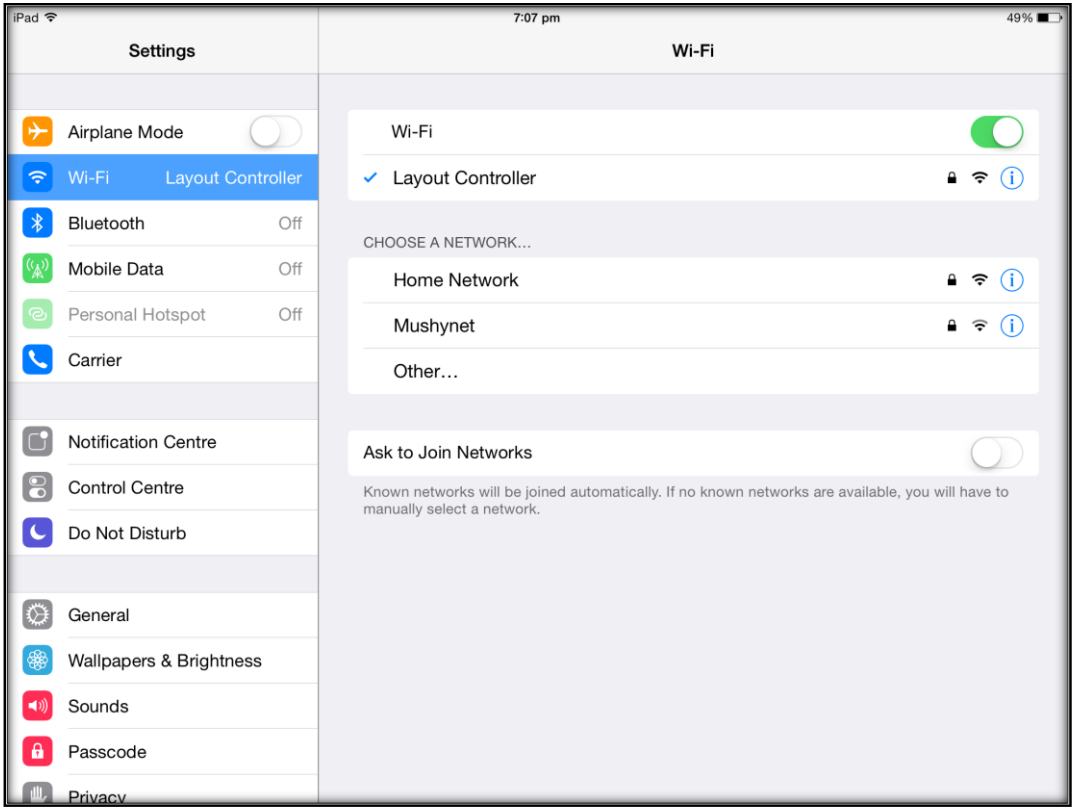
5. Using the iPad app

The iPad app can be used with or without physical panels. The iPad connects to the Layout Controller via Wi-Fi. The iPad app (named Layout Control) loads the required panels from the Layout Controller. Operators then press switches on the panels to control turnouts and other devices on the layout. There are several steps required before you can start using the panels via the iPad app.

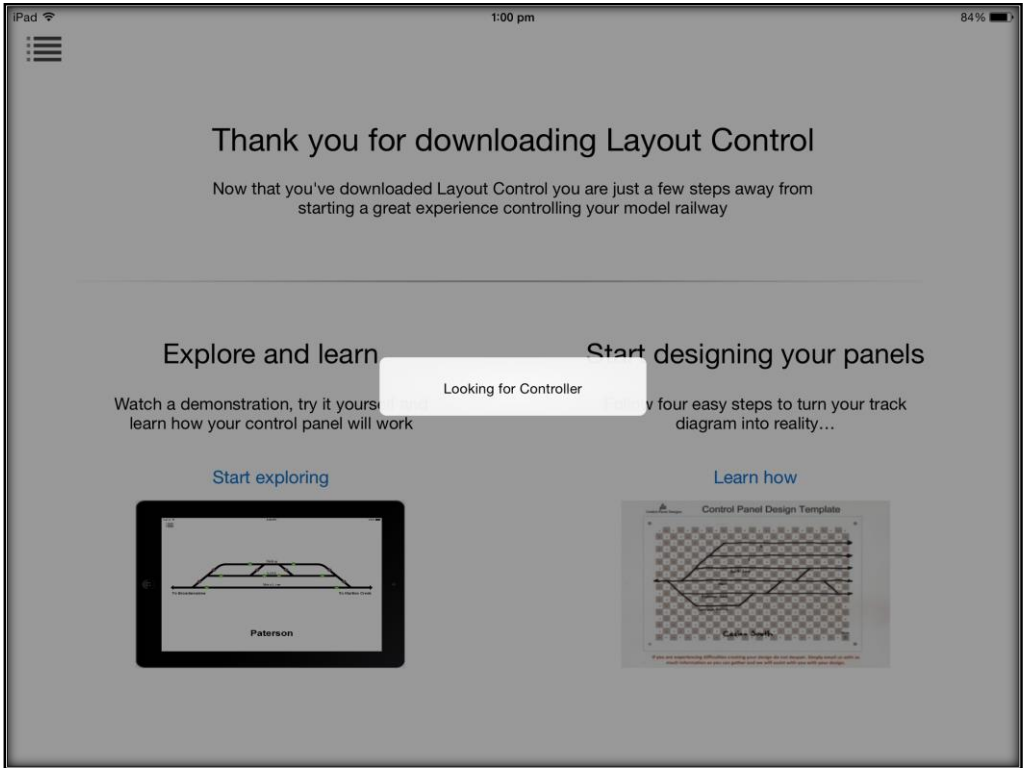
1. **Connect the iPad to the internet** and download the app named 'Layout Control' from the Apple App store.



2. **Open ‘Settings’ on the iPad and connect to the Layout Controller** Wi-Fi network named ‘Layout Controller’. The Wi-Fi password to gain access to the Layout Controller network is “contr0lz”. (please note it is spelt with a zero)



3. **Open the 'Layout Control' app on the iPad.** The app will automatically attempt to connect to the Layout Controller and load the control panels associated with that Layout Controller. If the iPad is not connected to the Layout Controller Wi-Fi network then the Layout Controller will not be found.

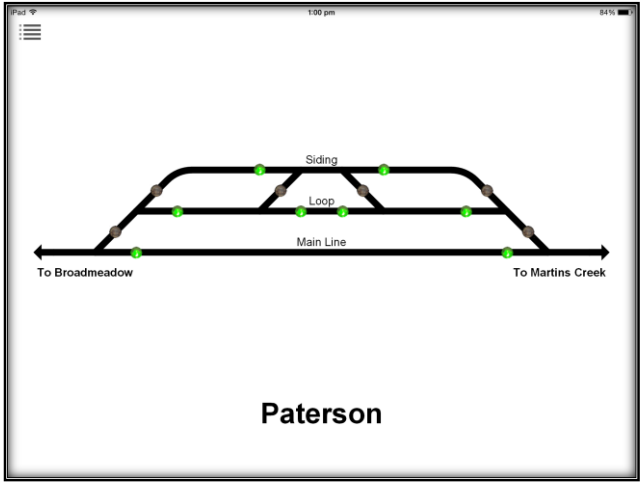


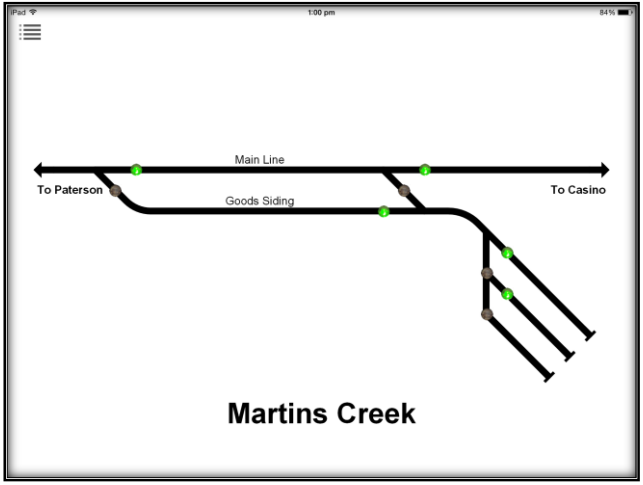
If the app successfully connects to the Layout Controller then the first control panel will load in the app. Your track schematic, LED switches, and the menu icon will be evident.

There will often be more than one control panel required. To access the other control panels simply swipe left or right on the iPad screen to switch between different control panels.

Operation of the iPad control panels is similar to that of physical control panels where the operator selects routes by pressing switches. Current routes are shown with lit switches. To change a route select one or more non-lit switches.

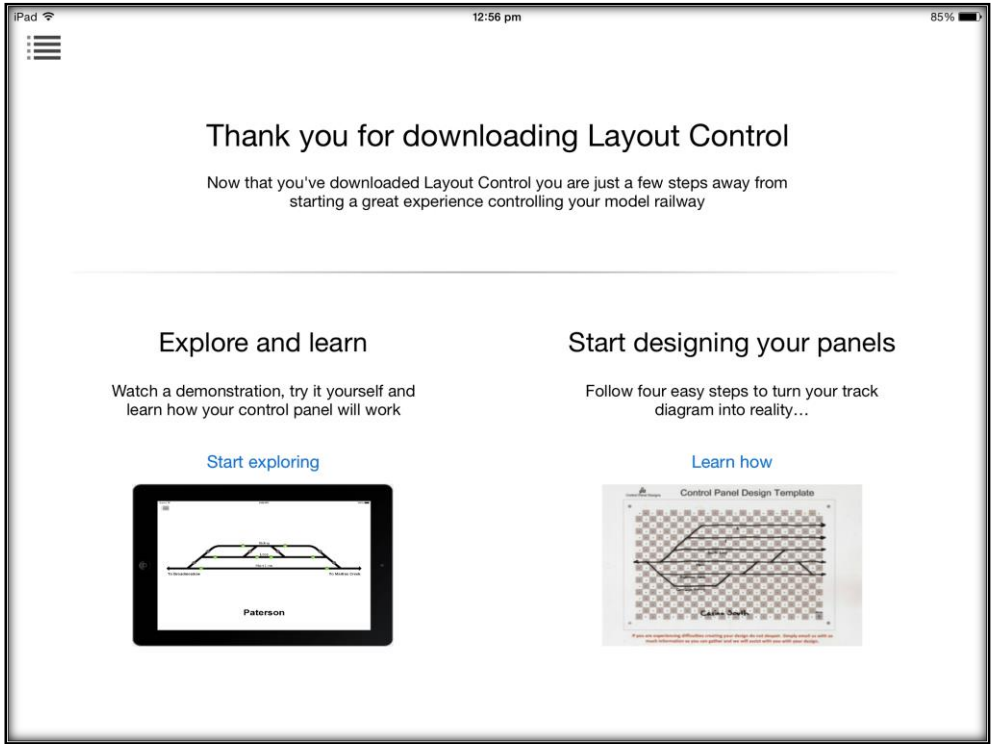
The route is changed and the switch is lit to indicate the new route.





If no Layout Controller is found or present, then the app Default page will load. There are two links on this page.

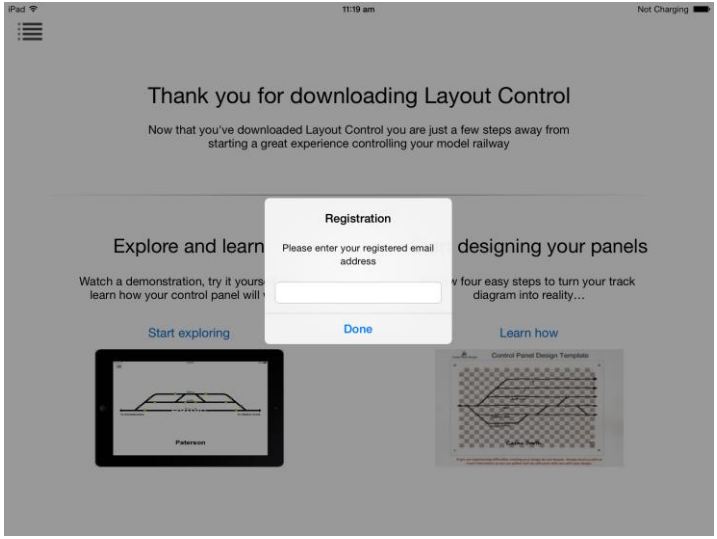
1. A demonstration of how the solution works
2. A guide to submitting your track design for a no obligation free design and quote.



Updating the Layout Controller with the iPad app

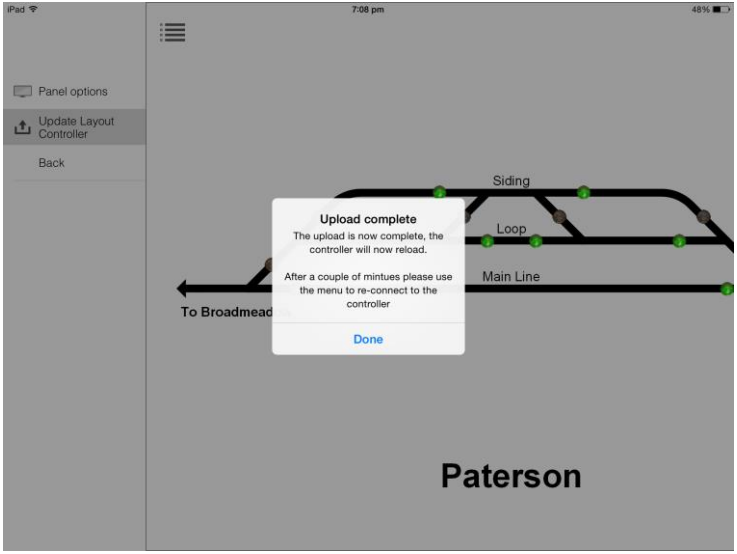
If required, customers can update the Layout Controller design and configuration by using the iPad app to download any updates from the internet, and then apply those updates to the Layout Controller. To download any updates:

1. Using iPad 'Settings', select a WiFi network that provides access to the internet. (This will disconnect the iPad from the Layout Controller WiFi network).
2. Open the iPad app ('Layout Control')
3. Select "Download Updates" from the Main Menu of the iPad app
4. You will be prompted for an email address. Enter the email address that you have registered with Control Panel Designs and press 'Done'.
5. A message box will appear when the download is complete.



Once downloaded, this update is stored on the iPad. It then needs to be applied to the Layout Controller by ‘uploading’ it. To do that you need to reconnect to the Layout Controller WiFi network:

1. Using iPad ‘Settings’, connect the iPad to the Layout Controller Wi-Fi network.
2. Open the iPad app (‘Layout Control’) on the iPad
3. If the iPad app is not showing your panels on the screen press ‘Connect’ on the main menu.
4. Then to update the Layout Controller select ‘Settings’ from the main menu of the iPad app.
5. In the Settings menu in the iPad app select ‘Update Controller’. The Layout Controller will be automatically updated.
6. When the Layout Controller has been updated a message box will appear on the screen of the iPad app.
7. The Layout Controller will then restart. This will take approximately 60 seconds. When the Layout Controller has restarted the new design and configuration will be evident.



Settings

Control Panel Settings

The ‘Mode Switch’ is located on the bottom right hand corner of the control panel fascia. The ‘Mode Switch’ is used to change configuration settings of each control panel. The mode switch LED is “Blue” in colour.

Figure 20 Corner of Control Panel showing 'Mode Switch'

There are four configuration modes for each control panel. They are:

CONFIG MODE 1. Change Default Route Settings
CONFIG MODE 2. Set LED indications to flash when REMOTE CONTROL is activated
CONFIG MODE 3. Set which turnouts can be remotely controlled
CONFIG MODE 4. Reserved for future use.

CONFIG MODE 1 applies to any control panel. Use this mode to change the default route settings of your turnouts when the control panel is powered 'On'.

CONFIG MODE 2 and 3 are both only applicable if you are using the optional Input Modules to remotely control the panel. CONFIG MODE 2 provides the choice of flashing or non-flashing LEDs when the control panel is put into REMOTE CONTROL mode. CONFIG MODE 3 provides for the choice of which turnouts can be remotely controlled.

To enter one of the CONFIG MODES you first press the Mode switch on the control panel and advance through each of the four possible CONFIG MODES by pressing the mode switch. If by the fifth press of the Mode Switch a CONFIG MODE has not been selected the panel will revert to normal operation.

- Otherwise, after pressing the Mode Switch the first time a single Switch will be lit on the panel representing CONFIG MODE 1.
- To select CONFIG MODE 1 press the single lit Switch. If instead you press the Mode Switch then two Switches will be lit.
- By pressing either of the two lit Switches you will enter CONFIG MODE 2.
- Otherwise, after pressing the Mode Switch again there will now be three Switches.
- By pressing any of the three lit Switches you will enter CONFIG MODE 3, and so on, and so forth.

CONFIG MODE 1 - Changing Default Route Settings

When the Control Panel is powered 'On' it sets all turnout switches to a "Default Setting". Thus a 'Default Route' is set for all turnout motors connected to the Control Panel. The 'Default Route' can be changed at any time by configuring the Control Panel using the 'Mode Switch' and entering CONFIG MODE 1.

To change the 'Default Route' settings on a Control Panel use the following procedure:

Step	Description	Notes
1	**Press the 'Mode Switch' on the front of the Control Panel.**	Control panel enters CONFIG MODE. The LED in one Switch on the panel will be flashing.
2	**Press the only lit Switch**	The control panel enters CONFIG MODE 1. The turnout Switch LEDs that are 'On' indicate the currently set 'Default Route' for that panel.
3	**Select new 'Default Route' by pressing the appropriate Turnout Switches.**	The LEDs in selected switches will turn 'On', indicating the current default route settings. Select the new default position for each Turnout associated with the Control Panel by pressing the appropriate tactile switch. LEDs on paired Turnout Switches will also be 'On'.
4	**Press the "Mode Switch".**	The Mode Switch LED will turn 'Off'. The turnouts will be restored to the positions they were in before entering the "Default Route" mode. New 'Default Route' settings have been saved. This can be tested by turning the panel 'Off', then 'On'.

CONFIG MODE 2 - Set LED indications to flash when REMOTE CONTROL is activated

This setting is only applicable when Input Modules are used with the Control Panel solution. When the REMOTE CONTROL signalling port on the Input Module is activated certain switches on the panel will be locked, so that only the remote control operator can control those switches/turnouts.

Customers have a choice of whether the REMOTE CONTROL tactile switches “Flash” or not. This setting can be changed at any time by configuring the Control Panel using the ‘Mode Switch’ and changing the setting for CONFIG MODE 2. To change the REMOTE CONTROL “Flashing”’ settings on a Control Panel use the following procedure:

Step	Description	Notes
1	**Press the ‘Mode Switch’ on the front of the Control Panel.**	Control panel enters CONFIG MODE. The LED in one Switch on the panel will be flashing.
2	**Press the ‘Mode Switch’ again.**	Two LEDs on the control panel will flash. This indicates that the panel is ready to enter CONFIG MODE 2 or to advance to CONFIG MODE 3.
3	**Press one of the two lit Switch/LED’s**	One Switch/LED for each turnout will either be ‘On’ or be ‘Flashing’. Now is the time to select either “Flashing” or “Non-Flashing” for all turnouts on the panel. For “Flashing” select the Switch with the “Flashing” LED. For non-Flashing select the Switch with the ‘On’ LED.
4	**Press the ‘Mode Switch’**	The Mode Switch LED will turn ‘Off’. The indication setting for when the panel is in REMOTE CONTROL mode will be changed and saved. The panel will return to normal operation.

CONFIG MODE 3 – Set which turnouts can be remotely controlled

This setting is only applicable when Input Modules are used with the Control Panel solution. When the REMOTE CONTROL signalling port on the Input Module is activated certain switches on the panel will be locked, so that only the remote control operator can control those switches/turnouts. Customers have a choice of which switches/turnouts can be remotely controlled. This setting can be changed at any time by configuring the Control Panel using the 'Mode Switch' and changing the setting for CONFIG MODE 3.

To change which switches/turnouts can be remotely controlled use the following procedure

Step	Description	Notes
1	**Press the 'Mode Switch' on the front of the Control Panel.**	Control panel enters CONFIG MODE. The LED in one Switch on the panel will be flashing.
2	**Press the 'Mode Switch' again.**	Two LEDs on the control panel will flash. This indicates that the panel is ready to enter CONFIG MODE 2 or to advance to CONFIG MODE 3.
3	**Press the 'Mode Switch' again.**	Three LEDs on the control panel will flash. This indicates that the panel is ready to enter CONFIG MODE 3 or to advance to CONFIG MODE 4.
4	**Press one of the three lit Switches**	Each Switch/LED that is associated with a turnout that can be REMOTE CONTROLLED will be lit. Now is the time to select which turnouts you want to be REMOTE CONTROLLED. Press the Switch/LED for each turnout that needs to be locked when the panel is being REMOTE CONTROLLED.
5	**Press the 'Mode Switch'**	The Mode Switch LED will turn 'Off'. The turnout settings for when the panel is in REMOTE CONTROL mode will be changed and saved. The panel will return to normal operation.

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