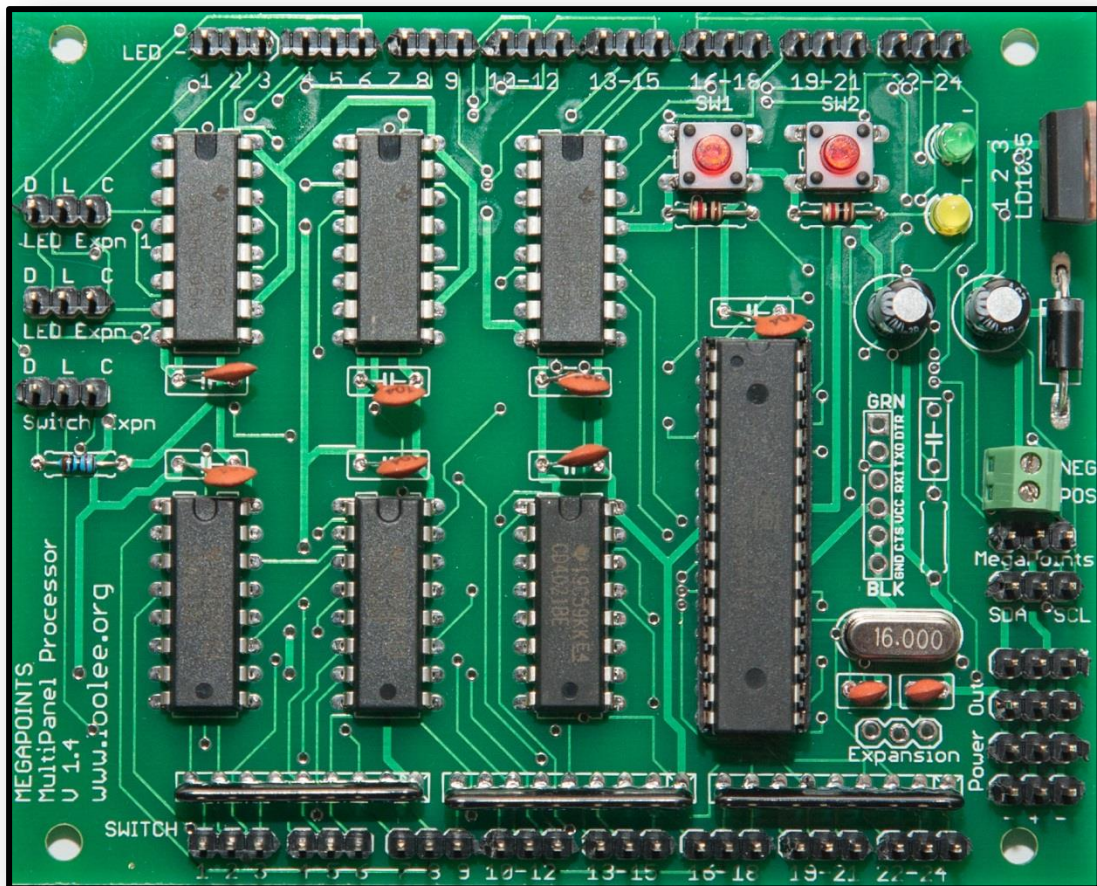


MegaPoints MultiPanel

Easily create networked mimic panels allowing cooperative shared control of your model railway while reducing cabling complexity.



User guide

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Email: info@megapointscontrollers.com

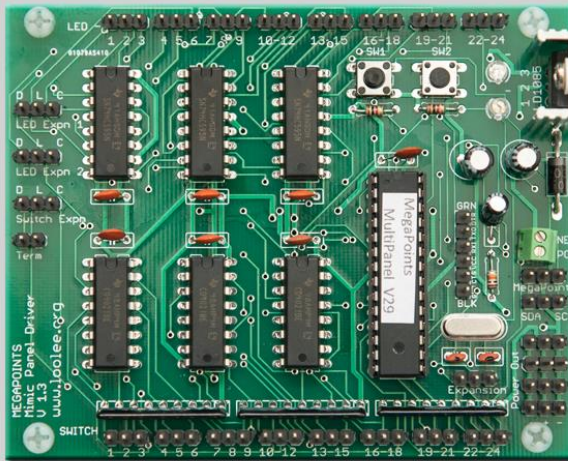
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What's included

The following items are included with each MultiPanel:

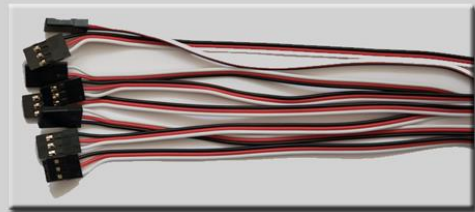
- 1 x Processor board
- 1 x Test hook-up cable
- 8 x LED connector cables and plugs
- 8 x switch connector cables and plugs
- 1 x MegaPoints Servo Controller pull-up resistor



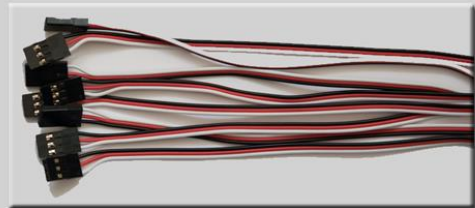
Processor board



**MultiPanel to Servo Controller
test cable**



**8 x LED hookup cables
and plugs**



**8 x switch connector cables
and plugs**



**1 x Servo Controller
Pullup resistor**

Introduction

The MultiPanel provides an easy connection to 16 MegaPoints Servo Controllers for up to 192 individually addressable sets of points (*servos*) via a single cable. Multiple MultiPanels may share control on the same cable for cooperative operation. Any changes made on one panel are immediately reflected on all other panels. Operator attention is drawn to changes by flashing LEDs indicating what change has been made.

Modular

Designed as a modular system that expands in units of 24, the railway modeller only needs to purchase what is needed for their layout. This saves cost and complexity as it is not necessary to have a system with 192 button connections when only 24 or 48 are required. Additional LED and button modules are available and easily added as required.

Flexible indication

If you prefer the simplicity of an ON/OFF LED to indicate when a point is set, you only need to connect the positive lead to the main panel or LED expansion board. If you require a second LED to indicate which or the routes are ON this is easily accomplished by adding an LED driver board to the complimentary indicator connection (*LED Expn 2*). This ensures that when the main LED is ON, the complimentary LED is off and vice versa.

There are many different types of LEDs and choice is left to the modeller. Contact us for advice or guidance on the many sizes colours and lens shapes available for your mimic panel.

Ease of installation

To make installation simple as possible, snap on test boards are available with 24 LEDs and buttons. These stack on top of the processor boards and allow you to operate the system on the bench before going near a layout. This allows you to become familiar with its operation before touching any tools. Simply snapping in place the test board over the connectors hooks up all LEDs and buttons providing full operation. All you need to do to complete the installation is wire up your own LEDs and buttons to your mimic panels.

DCC Module

When the MegaPoints DCC Module is connected to a MultiPanel it can decode up to 192 accessory addresses. This means that only one DCC module is needed for the entire network.

New features / changes

The table below lists new features that have been introduced:

Software version	Date	Feature
32	Aug 2015	Added sub panels. See page 8.

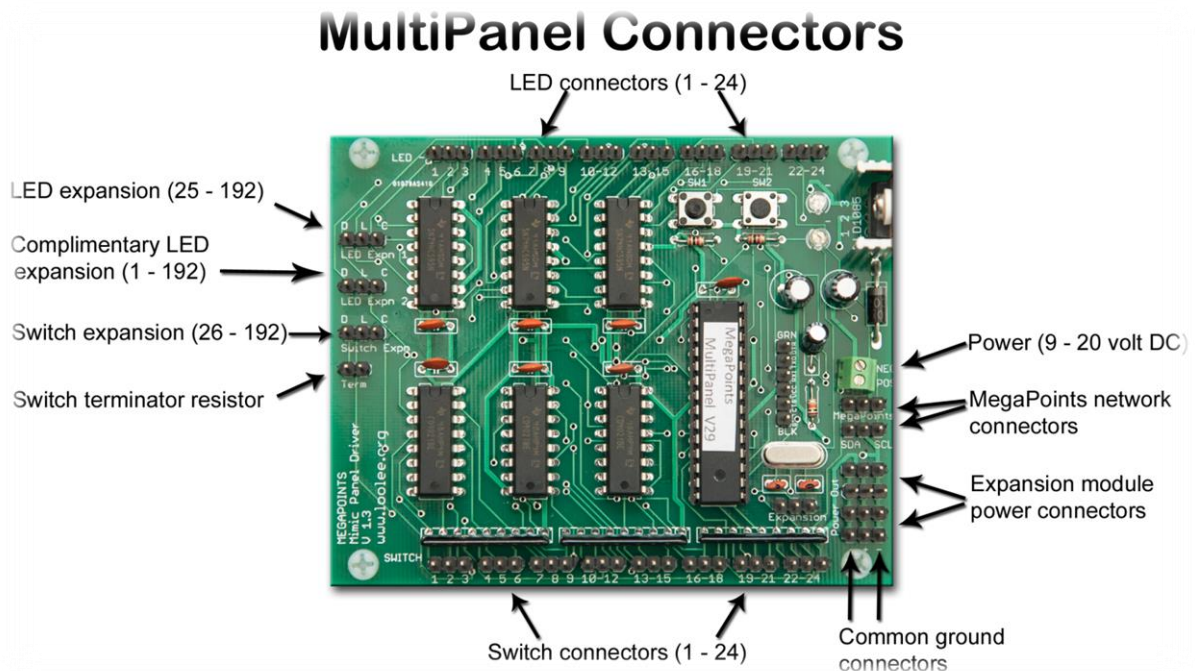
MegaPoints Controllers use static sensitive components that must be handled with care.

Avoid touching any components or the circuit printed on the bottom of the board.

Avoid placing the board on any metallic surfaces including track.

Hooking up

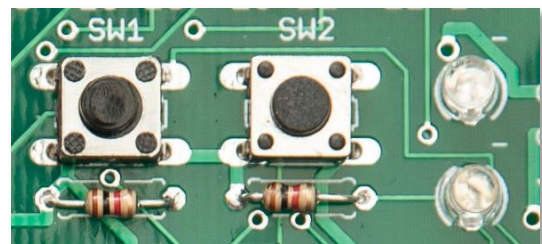
The following picture shows the various connectors to the MultiPanel processor board. The board contains connectors for 24 LED (*top*) and 24 buttons (*bottom*). LED and switch expansion modules connect to the left side of the board. Power is supplied to the screw terminals on the right side of the board. Power for expansion modules is supplied from the lower right connectors (x4). Two MegaPoints network connectors are provided below the power connector. Two MegaPoints network connectors are provided below the power connector.



Switches and indicators

The MultiPanel processor board contains two LED indicators and two buttons.

Upper LED: The upper LED indicates whether the board will store the state of the layout after it is powered off (*master mode*) when continuously illuminated. If the upper LED is flashing, this indicates the unit is configured as a sub panel and counting the number of flashes indicates the sub panel base address. If multiple MultiPanels are used on one layout together, only one should store state. All other MultiPanels should have the upper LED extinguished or flashing. For more information on sub panels see page 8.



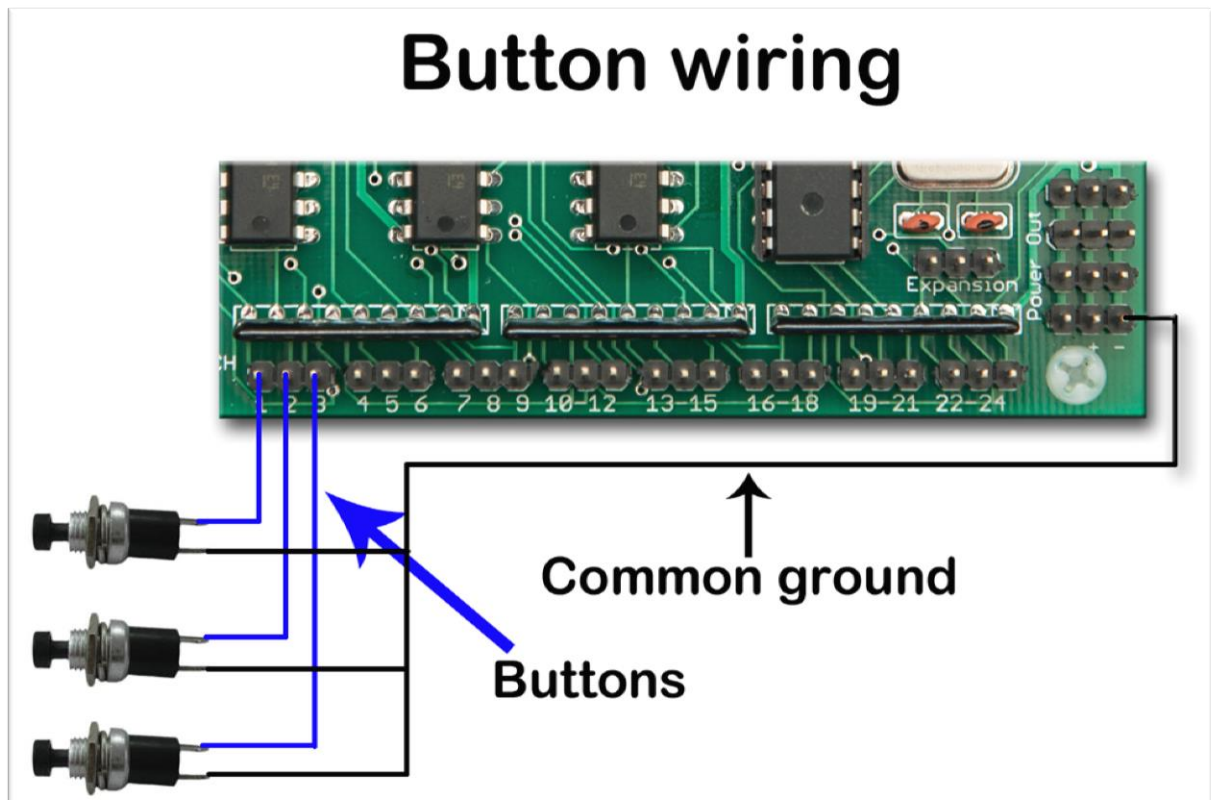
Lower LED: The lower LED flashes approximately once per second to indicate the processor is running when not configured as a sub panel. There should always be one LED flashing to indicate the processor is running.

Left Button (SW1): Pressing and holding this for approximately 2 seconds will toggle the ability to store state when powered off (*master mode*). Press and hold to extinguish or illuminate the upper LED and change modes. If more than one MultiPanel is connected, only one should have master mode set. All others must be set to slave mode (*upper LED extinguished*).

Right Button (SW2): This button is only active when the unit is not in master mode (*lower LED is flashing*) and is used to change the sub panel base address. Pressing this will increment the sub panel base address from 1 to 7 after which it will disable the feature (top LED *stops flashing*, bottom LED *flashes*) before starting again at 1.

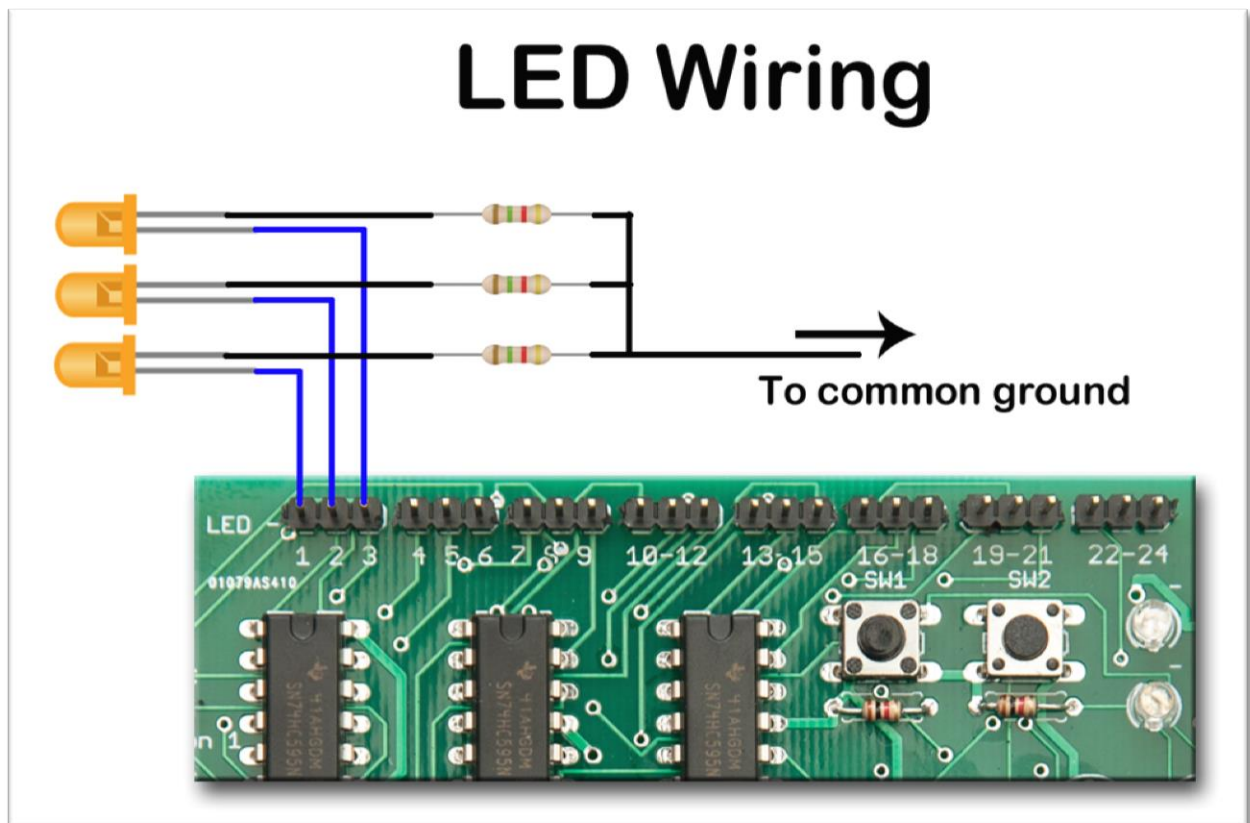
Wiring buttons

Use normally open (*push to make*) push buttons with the MultiPanel. Each press will toggle the points or semaphore. See the connection diagram below.



All buttons can be connected to one of the common ground pins on the lower right of the processor board.

Wiring LEDs



Refer to the above diagram for hooking up LEDs. Use a 1k resistor (*Brown, Black, and Red at 1/8th watt*). If you wish to use a lower value resistor it may require an external 5 volt power supply.

First time use

Follow these steps to quickly get started with your first MultiPanel:

- Hook up LEDs and resistors (*or use optional test panel*).
- Hook up buttons (*or use optional test panel*).
- Connect power to screw terminals and turn on observing correct polarity.
- Check upper LED is steadily illuminated. Press and hold SW1 (*left*) for 2 seconds until it illuminates if not.
- Connect using short cable to already powered MegaPoints Servo Controller board.
- Set slave mode on MegaPoints Servo Controller (*LOW button while applying power*).
- Set network address on MegaPoints Servo Controller back to 2 (*if you changed it previously*).
- Press buttons, observe LEDs flashing as they change state.
- Press buttons again to switch back after LED completes its flashing cycle.
- Observe servo movement as state changes.

Adding subsequent MultiPanels

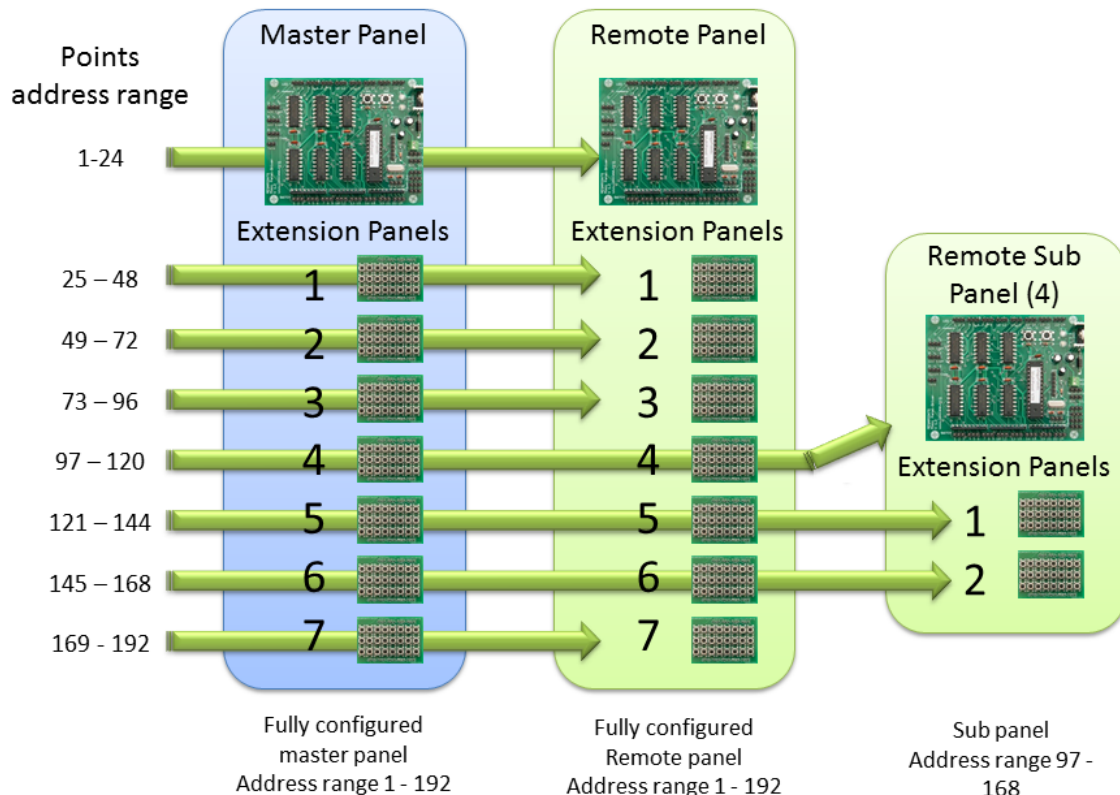
Repeat the steps above for subsequent panels connected to the same network except:

- If the upper LED is illuminated, press and hold SW1 for approx. 2 seconds until it extinguishes to enable slave mode.

Sub panels

Software version 32 introduces sub panels.

MultiPanel - Sub Panel Example



Sub panels allow remote MultiPanels to control a specific block of the address range without having to add expansion modules in the lower ranges. In the diagram above you can see two fully expanded MultiPanels, each capable of switching all points in the address range 1 – 192. A third MultiPanel configured as a sub panel address 4 that operates the points in the range 97 – 168. You are free to configure as many sub panels as required. Each can be set between the sub panel ranges 1 – 7. Any expansion boards fitted to the sub panel will operate on the next block up to the maximum of 7. Any blocks over 7 are ignored.

To configure a sub panel, ensure the master LED is not constantly illuminated. If it is press and hold SW1 for two seconds to extinguish it and set slave mode.

If the lower LED is flashing the MultiPanel is configured as a normal remote panel. To set a sub panel address, press SW2. The top LED will begin to flash the sub panel address block (1-7). Subsequent presses of SW2 will increment the sub panel block up to 7. Pressing SW2 again disables sub panels and the lower LED will begin to flash again.

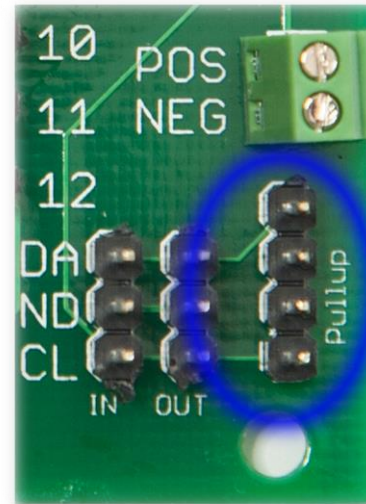
External voltage regulator

The internal voltage regulator is capable of supplying power to the base MultiPanel processor and up to two expansion boards (*max 72 points/semaphores*). Beyond this an external switching voltage regulator must be fitted to handle the additional power requirements allowing the MultiPanel to be configured right up to the maximum 192. Users who have purchased a MultiPanel AND three or more LED and switch expansion modules may contact me for a free external regulator. Users may optionally choose to fit this as standard even if less than 72 points are configured within the MultiPanel.

The MegaPoints Network

Overview

The MultiPanel communicates with MegaPoints Servo Controllers via the network connectors. This is a bidirectional data bus that runs over three wires between each of the components. This same network is also used when a DCC module is fitted to a points Controller or where points Controllers are coupled together in a master-slave relationship. With up to 16 MegaPoints Servo Controllers, five MultiPanels and a DCC Gateway installed the network can become a busy place as each unit updates its status to all other devices.



The network cabling has been kept as simple as possible and only requires three core cables to operate. Each device should have its SDA (*data*), SCL (*clock*) and GND (*ground*) connected together. As cable length increases capacitance becomes an issue that may need to be managed. We have tested network cable lengths over 800 feet long. To combat the line capacitance, each of the MegaPoints Servo Controller boards has a four pin connector labelled “pullup”. Up to four of the MegaPoints Servo Controllers can have pullup resistors fitted to this socket to achieve the cable lengths previously mentioned.

Each of the MultiPanels includes two sets of pullup resistors for this purpose.

Before ordering a MultiPanel, I highly recommend emailing me your expected installation requirements so I can give you the best advice possible and ensure you have everything you need for success.

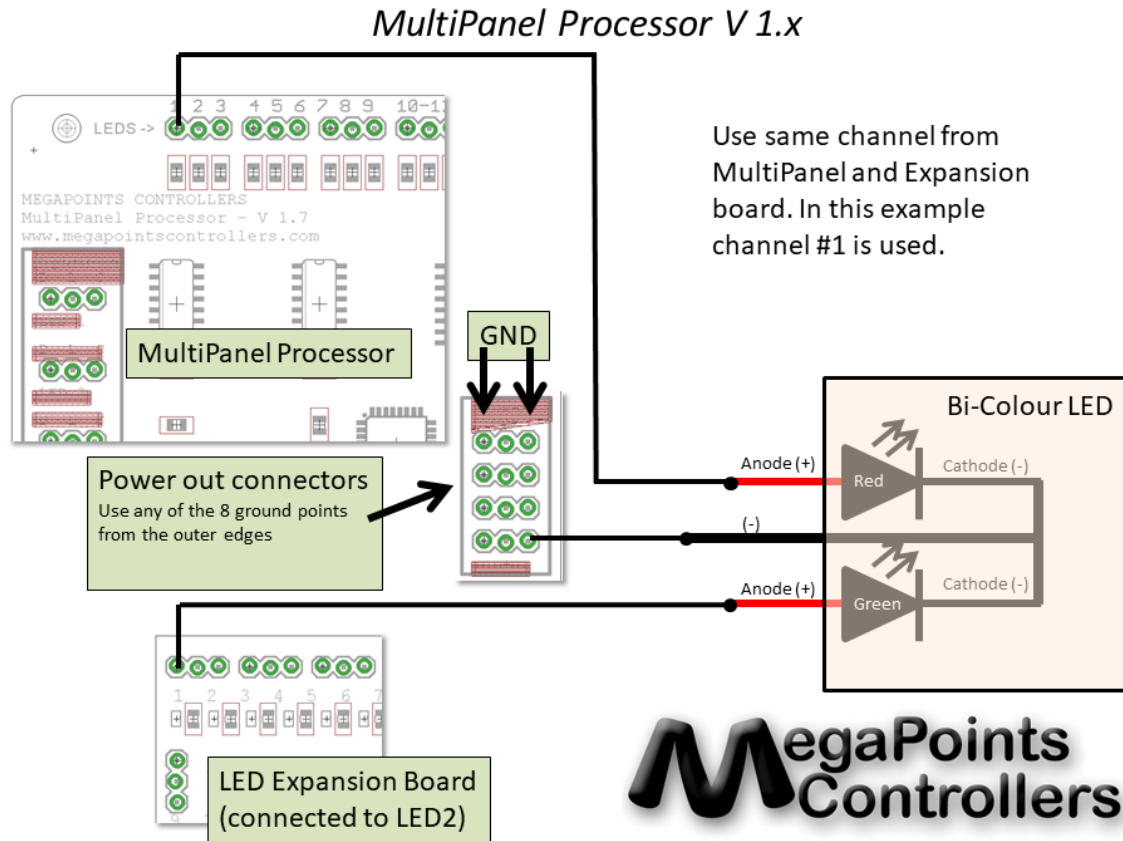
Network Addresses

Each of the MegaPoints Servo Controllers should have a unique address on the network (2-17). MegaPoints Servo Controllers that use the same address will operate at the same time and can be used for example at opposite ends of long fiddle yard roads where it is desired to switch both ends with a single button.

The network address is set with the first four input switches on each MegaPoints Servo Controller board. See the section “Changing the slave unit network address” in the MegaPoints Servo Controller User Guide for details on how to do this.

Connecting bi-colour LEDs

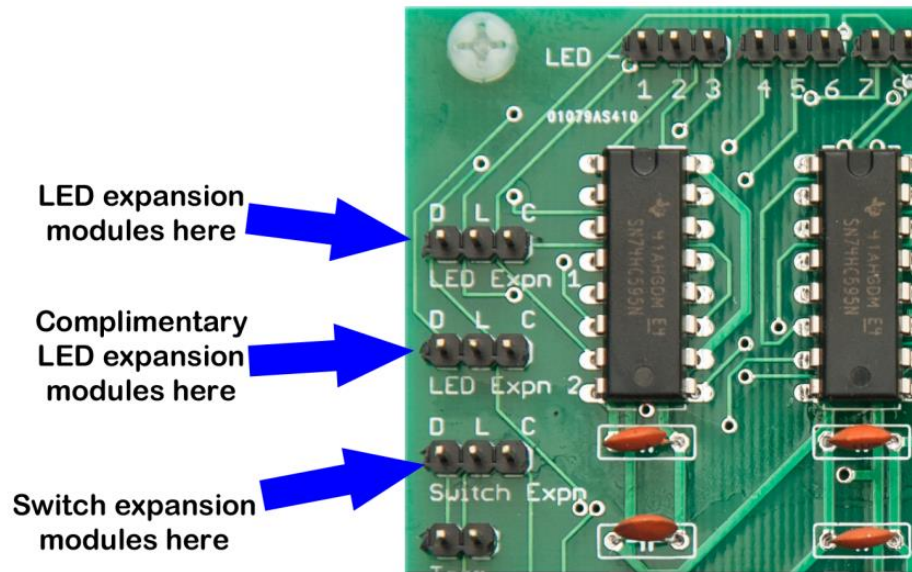
It is possible to connect bi-colour LEDs if an LED expansion board is connected to the LED2 connector. Follow this diagram for hooking up. There's also a video demonstrating this technique.



Optional accessories

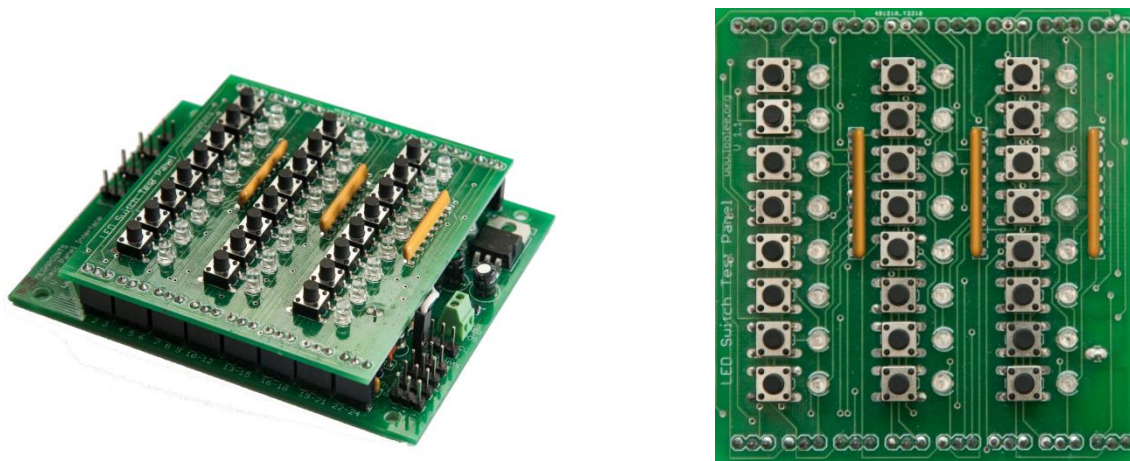
Expansion connectors

The following expansion boards connect to expansion sockets as illustrated in the following diagram:



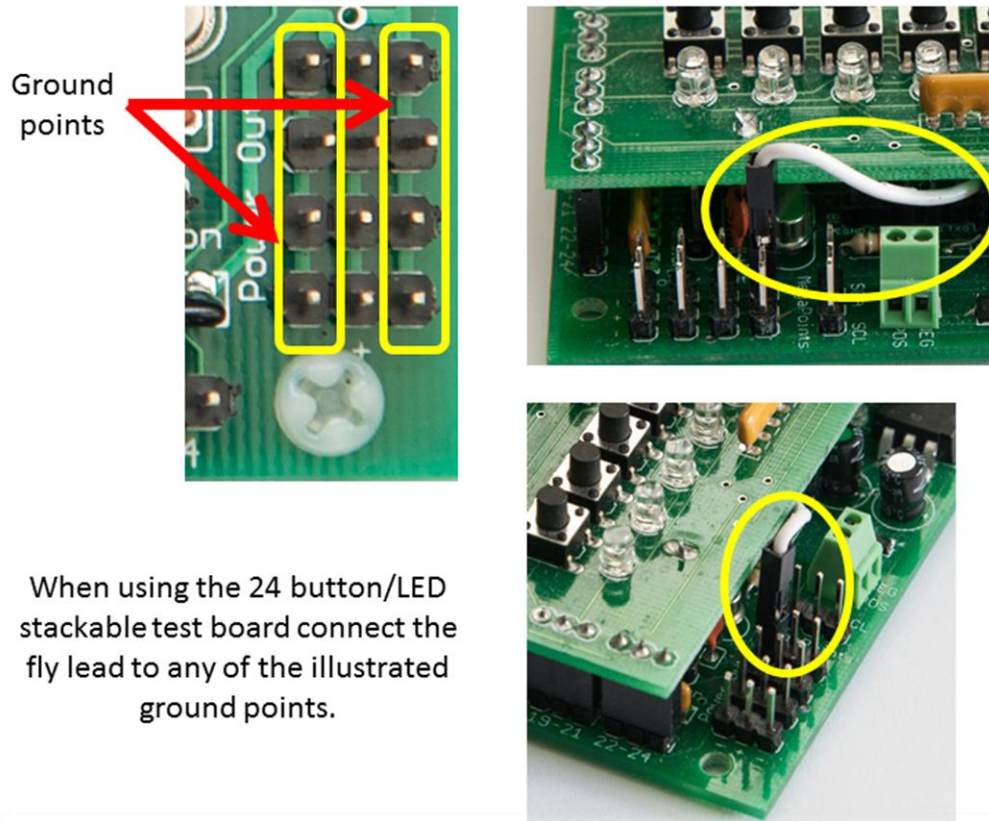
LED / Button stackable test board

This board is designed to fit on top of the processor board and uses the switch and LED connectors to provide instant access to 24 LEDs and buttons. By fitting this board you will be able to test your installation and become familiar with its operation before starting to develop your own personalised mimic panel.



This board has a ground fly lead that must be connected to one of the MultiPanel ground points when in use. See the following illustration for detail.

MegaPoints MultiPanel – LED/Button stackable test board Ground lead connection detail



Button expansion board

This board adds a further 24 button connectors to the MultiPanel processor board. Up to 7 may be and daisy chained together. When 7 boards are connected this provides the button input to 192 points / servos.

This board connects to the “Switch Expn” connector of the MultiPanel processor.

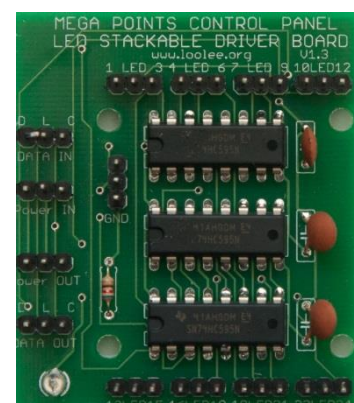
Button stackable test board

The stackable test expansion board the circuits from

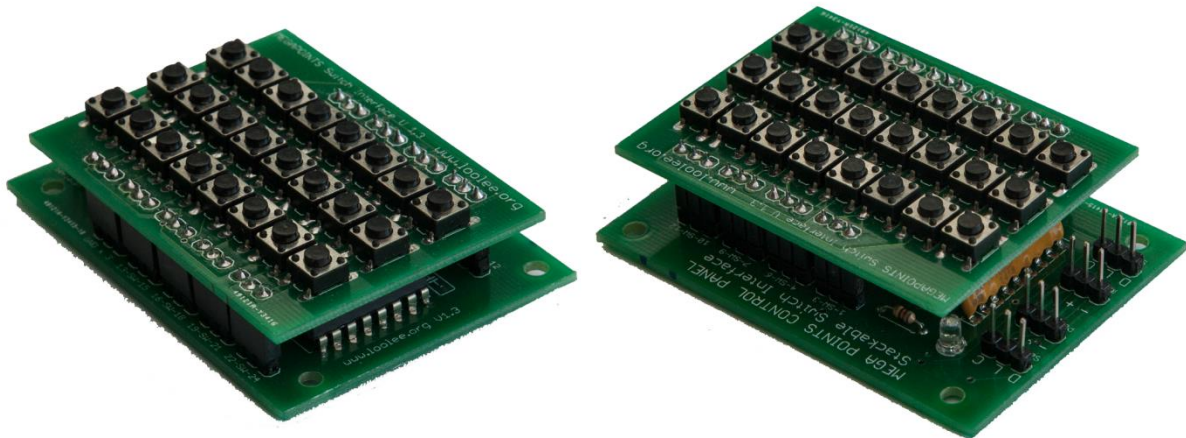


board

board plugs right on top of the button and provides immediate access to switch all the bench. This allows for easy testing



before going near your layout.



LED expansion board

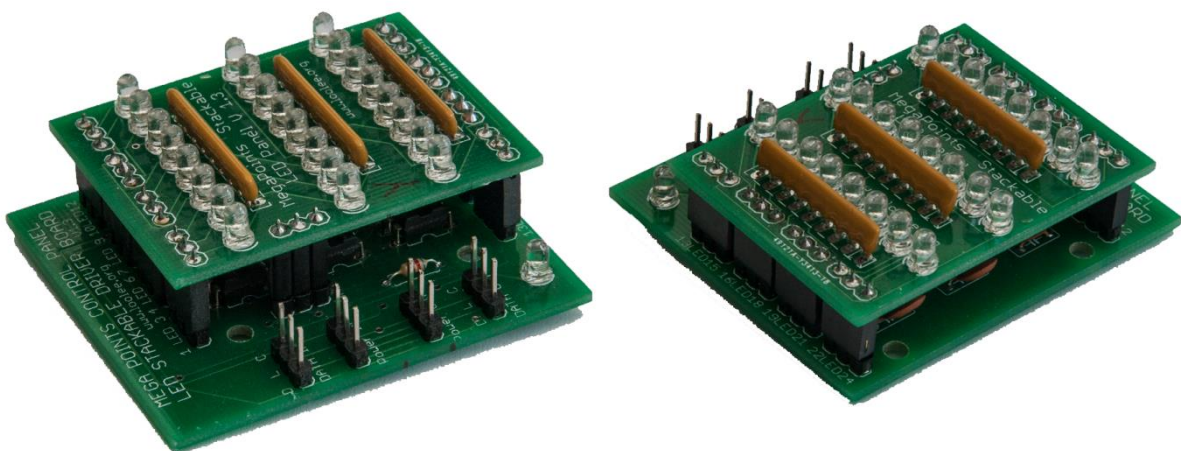
This board adds a further 24 LED connectors to the MultiPanel processor board. A total of 7 may be added and daisy chained together. When 7 boards are connected this provides the LED indicators for 192 points / servos.

This board connects to the “LED Expn 1” connector of the MultiPanel processor.

As second chain of 8 LED expansion boards may be added and connected to the “LED Expn 2” connector for complimentary LED indication (ON/ON).

LED stackable test board

The stackable test board plugs right on top of the LED expansion board and provides immediate access to further LED outputs from the bench. This allows for easy testing before going near your layout.



Contacting us

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If you have any product improvement suggestions we'd be very pleased to hear from you.

NOTE: We operate a policy of continuous improvement. Colours, specifications and even the placement of components may vary from time to time. Documentation will continue to be updated to reflect changes or answer frequent customer questions.