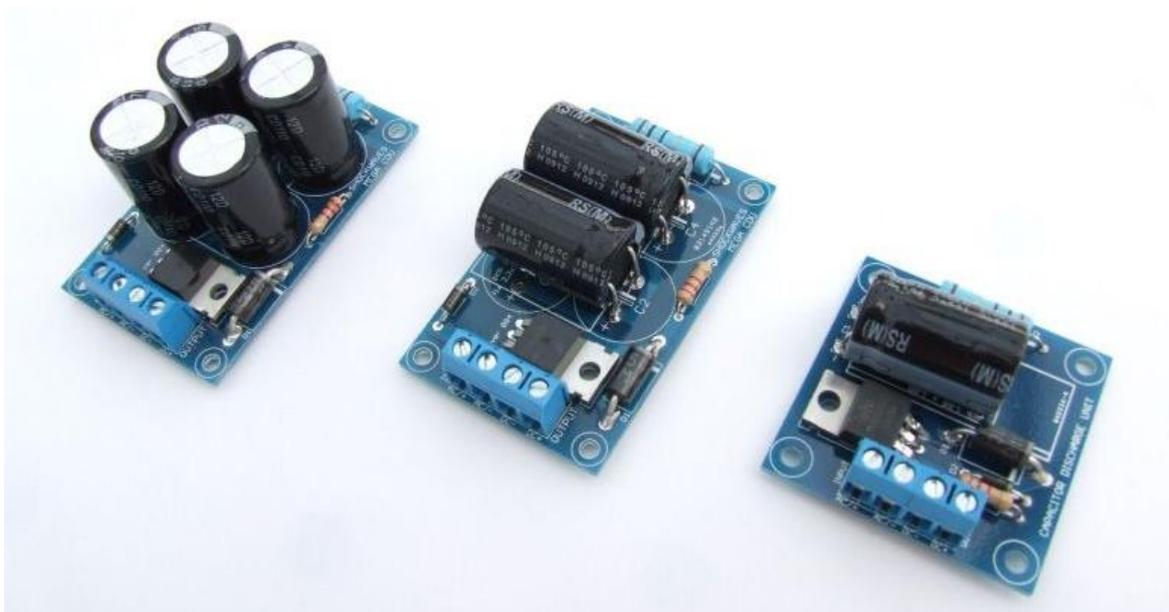# CAPACITOR DISCHARGE UNITS

CDUs of Various Capacities for all sizes of Layout

- Provide a high current pulse to operate points
- Prevent points' motor burn-out by limiting subsequent current
- Regulates charging current to prevent voltage fluctuations on the rest of the layout
- Versions available with Ready light

Model railways which use points primarily use points motors which creates a linear movement of about 5mm (1/4in) of the blades of the points.

To create this movement, the simplest device is the solenoid which consists of a coil of wire wound on a former. Inside the former is an iron actuator or slug which can be pulled into the coil when the power is applied. By placing two of these coils end-to-end, a forward and reverse motion can be created.
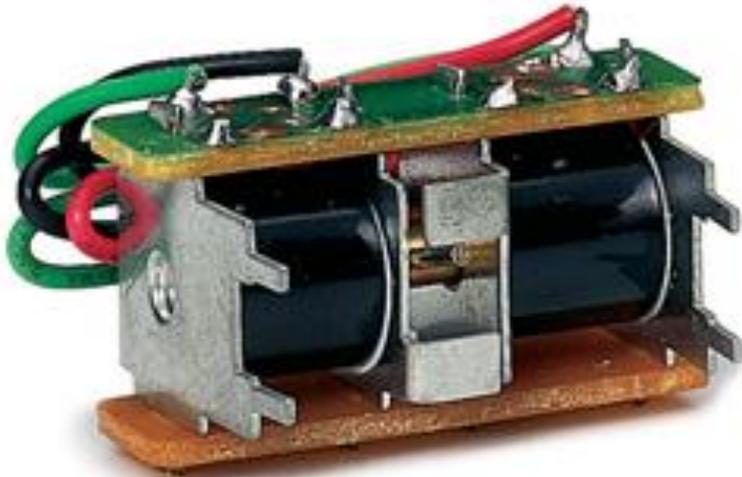
These two-solenoid point-motors are usually switched by short pulses of electricity. The pulse length is often determined by the operator or by a simple spring-loaded switch.

There are several problems with this arrangement. Point motors require a considerable amount of current for their operation. This means the full capacity of the transformer will be needed and any other items using the same supply may suffer voltage drop during the coil operation.

The high currents can also damage switches. The back emf (reverse voltage) generated by the solenoid is sometimes sufficient to cause sparks and can contaminate the switch contacts that, after a time, can weld the switch closed. This will keep the current flowing through the solenoid and it will overheat very quickly. A Capacitor Discharge Unit (CDU) overcomes all these problems.

CDUs supply a high current to the solenoid. This current burst is over by the time the switch contacts open, thus eliminating back emf across the switch contacts. Should a solenoid be left in circuit by the switch being held for a long period, the current flowing through the coil (after the initial surge) will be less than 50mA so it will not damage to the coil.

Models

Which CDU you will need depends on several factors: the number of points you want to use at the same time, the distance of the points from the controller, the wire size, the voltage and capability of your power supply, the gauge of the layout and so on.
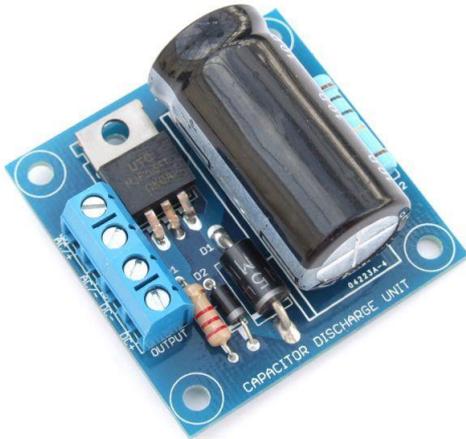
For a basic, compact layout, where you only want to operate one or two points at the same time, then our basic CDU will probably suffice.
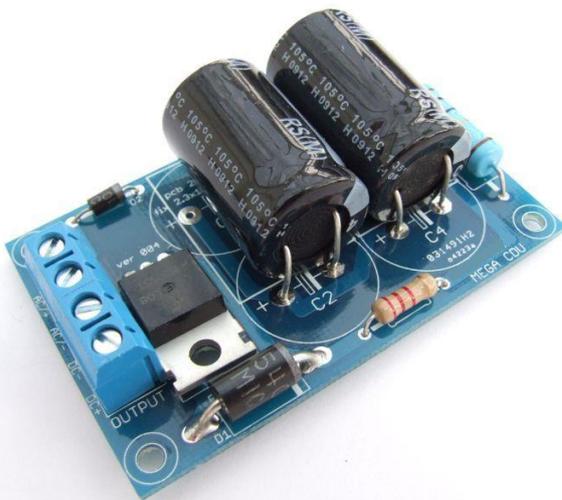
For a larger layout where now, or in the future, you may wish to operate several points at the same time and these may be some distance from the controller, then our 2C CDU is probably more suitable.

For the ultimate in performance and future proofing, then our 4C CDU is probably the most suitable.

The BLOCKsignalling CDU4R has a red LED on the PCB that lights when the capacitors are charged to 15V and above. Knowing the state of the charge on the capacitors is useful to confirm correct supply connection and to show that the capacitors are charged sufficiently. The led will also indicate if a points switch has inadvertently been left operated, as the LED will not re-light after the points operation.

Wiring

The CDU inputs can be connected to any DC power supply up to 24V or AC power supply up to 16V. The most common connection point would probably be the 16V AC auxiliary output usually found on model railway speed controllers. Old laptop power supplies can also be suitable as many have a 19.5V DC output. With DC supplies, be sure to connect them with the correct polarity to the CDU.
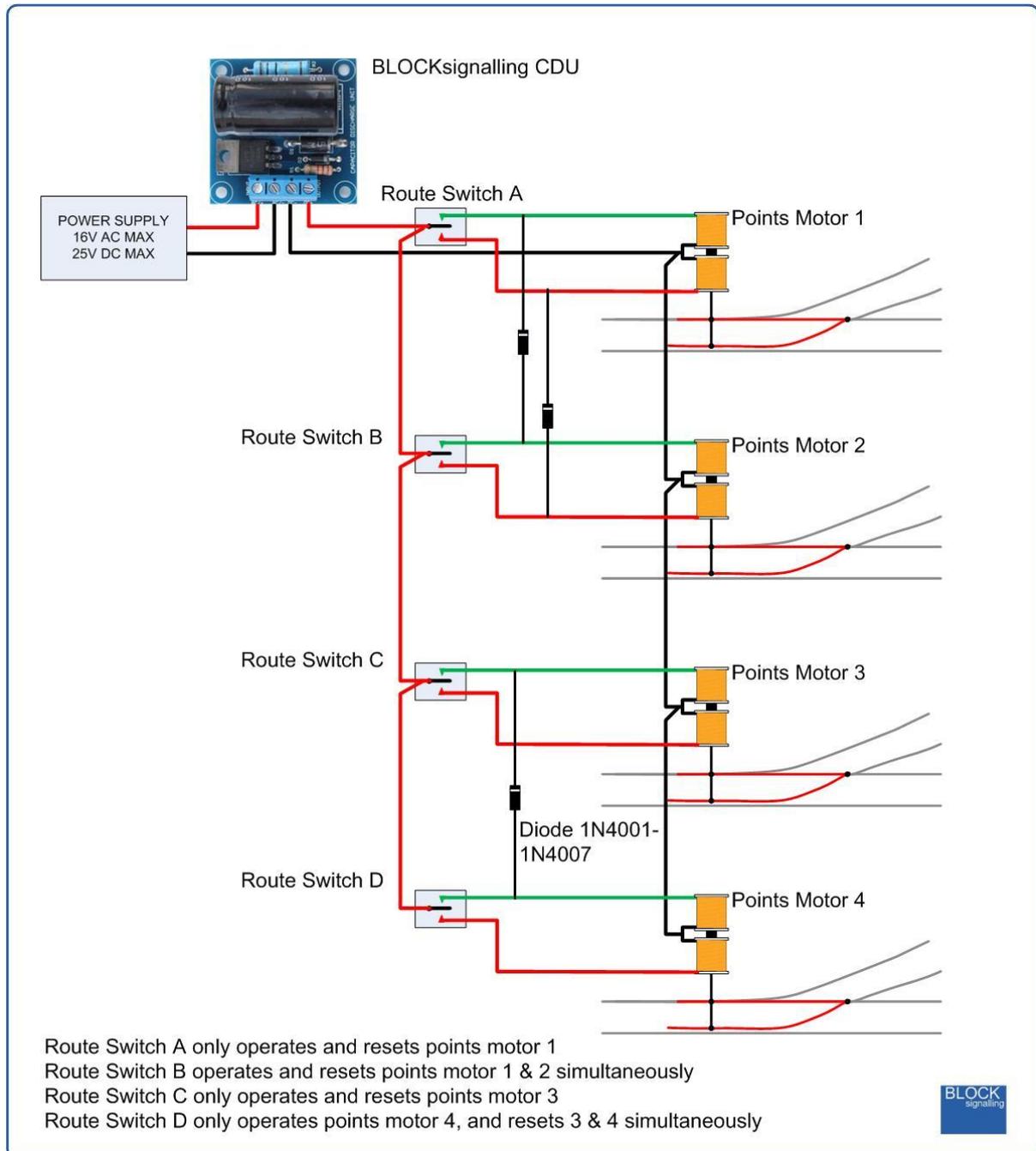
The minimum supply voltage is 12V AC or 15V DC, as below this level the CDU will no longer improve the action of the points.

The output terminals are connected to the points switches, with the CDU negative output generally connected to the common, centre point, of the points motors.
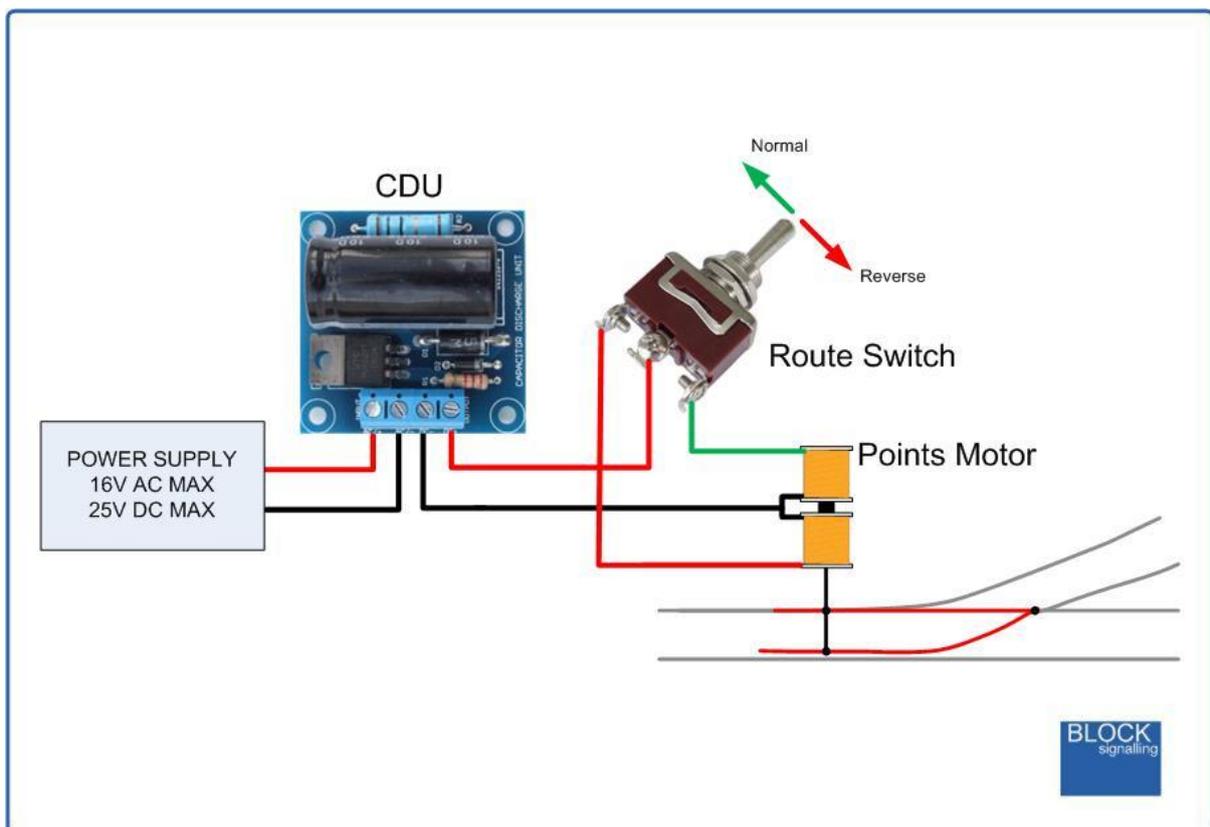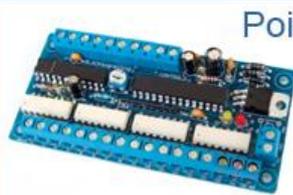
Other Ideas

Use general purpose diodes (1N4001-1N4007) to switch several sets of points simultaneously.

BLOCKsignalling CDU

POWER SUPPLY
16V AC MAX
25V DC MAX

Route Switch A — Points Motor 1

Route Switch B — Points Motor 2

Route Switch C — Points Motor 3

Diode 1N4001-1N4007

Route Switch D — Points Motor 4

Route Switch A only operates and resets points motor 1
Route Switch B operates and resets points motor 1 & 2 simultaneously
Route Switch C only operates and resets points motor 3
Route Switch D only operates points motor 4, and resets 3 & 4 simultaneously

BLOCK signalling

BLOCKsignalling

Product Range

Points Position Indicators

Shuttle Modules

Light Signal Modules

Traffic Light Modules
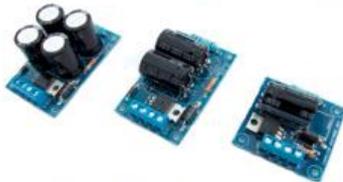
Capacitor Discharge Units
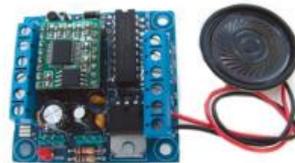
Level Crossing Modules

Points Controllers

Semaphore Signal Controllers