

How Smart Bypass Relays protect the vehicle.

Bypass relays protect the vehicle by making sure that the towbar wiring puts virtually no extra load on the vehicle's rear light circuits.

Relays

All switching and power to the trailer lighting is controlled by relays.

Switched by microchips

The relays used in Smart bypass relays are themselves switched by extremely low power microchips. These microchips are the only parts of the device that put any load on the car's lighting circuits: the typical load from a transistor will be less than a milli-amp. The interface circuits connecting the microchips to the vehicle wiring are themselves protected by resistors that limit any load to less than a milli-amp, and by diodes that prevent any current running from the device to the vehicle's wiring.

Power from the vehicle's main power source

All the power used to charge the coils of the relays and the power to supply the trailer road lights is taken directly from the vehicle's main power source (fusebox or battery).

Protection

The bypass relays prevent:

- Vehicle fuses blowing
- Vehicle showing a bulb-failure warning when the trailer is attached
- Vehicle wires overheating
- Poor performance of trailer lights
- Damage caused by short circuits in the trailer wiring

They also give protection against:

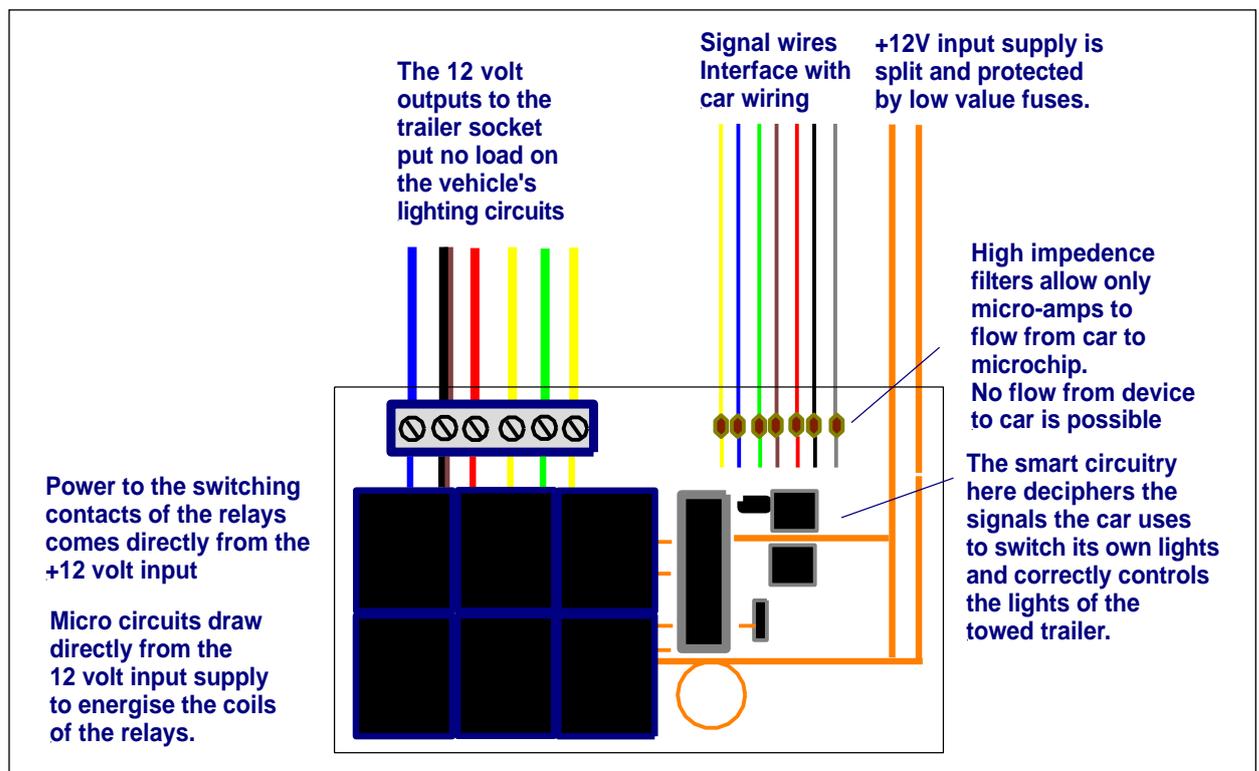
- electrical feedback from the trailer
- the vehicle's control systems being compromised
- the vehicle computer processing units (CPUs) being damaged

Because of the high level of protection built into the Smart Bypass, its installation cannot invalidate the host vehicle's warranty.

Additional towing-related functionality that is available in many new vehicles may be dependent on the installation of CANbus modules that interact with the vehicle. See SmartCAN modules on our website www.rydertowing.co.uk

The diagram on the next page further illustrates how the Smart Bypass works.

Ryder Smart Bypass relays are virtually isolated from the car's wiring



As can be seen from the diagram, the interface between the bypass relays and the car's lighting system is highly protected.

- The relay cannot "send" any electrical pulses or signals to the car's wiring.
- The current taken from each of the car circuits to activate the microcircuits is less than one milliamp.
- When the car is powered down, the device takes only micro-amps from the car's power source. It cannot impose a drain on the battery or "use up" any of the narrow margin of quiescent current that some modern cars allow.
- This protection and additional circuitry within the bypass relay, also means that the device will not be damaged by electrical surges (spikes) from the car.