General Guidelines for Electronic Kits and Assembled Modules

Thank you for choosing one of our products. Please take some time to carefully read the important information below concerning use of this product. The assembly and operating instructions are on the following pages. Help with component identification can be found on our website at www.quasarelectronics.co.uk/componentid.htm. If you are unsure about any aspect of the assembly or use of this product please contact our Support Team before proceeding.

WEEE Directive (Waste Electrical and Electronic Equipment)
Notice To All European Union Citizens. Important environmental information about this product.
The crossed out wheeled bin symbol on this product, package or documentation indicates that disposal of this product after its lifecycle could harm the environment. Do not dispose of this product (or batteries if used) as unsorted municipal waste. It should be disposed by a specialized company for recycling.
The unit should be returned to your distributor or to a local recycling service.
Please respect the local environmental rules. If in doubt contact your local authorities about waste disposal rules.

Safety: General rules concerning safe use of our Kits or Modules.
To ensure your safety, please observe these safety measures. In no way are these complete. As safety requirements vary, please check with your local authorities, in order to comply with local requirements. If in doubt, seek the help of a qualified person.

Battery or wall-adaptor operated devices are safe devices. They do not require special attention unless mains voltage is connected to an output e.g. a relay.

To ensure electrical safety, and also protection from fire or personal injury, make sure your mains operated equipment complies with these safety hints:

- Use a suitable plastic enclosure. If a metal enclosure is used, make sure it is properly earthed.
- Use a power switch if the device consumes more than 10W. Use a double pole switch for mains operated, transformer-less kits.
- Mount a fuse in series with the mains switch. Use a slow blow (T) 50mA fuse for transformers up to 10W and a 100mA fuse for transformers up to 20W.
- Use a mains input connector, or a robust power cord with a clamp.
- Internal wiring carrying mains voltages must have a minimum cross-sectional area of 0.5mm².

If supplied, attach the power rating label near the power cord of the device and fill-out the mains voltage, frequency, power consumption and fuse values.

Troubleshooting and Support
90% of non-working kits are due to poor soldering.
We operate a Get-You-Going service for non-working kits but there is a charge based on the time and components needed to complete the repair. Quite often it is not economically viable for us to repair and it is cheaper to supply a new ready-made product at full cost.

Disclaimer
Quasar Electronics reserves the right to change product specifications or to discontinue products without notice. Quasar Electronics cannot be held responsible for any loss or damage, direct or indirect, which might occur from the use of a product. Quasar Electronics Kits or Modules are intended for educational and demonstration purposes only. They are not intended for use in commercial applications. If they are used in such applications the purchaser assumes all responsibility for ensuring compliance with all local laws. In addition, they are not suitable for use as or as a part of life support systems, or systems that might create a hazardous situation of any kind.
General Description
This is a very useful accessory for 12V negative earth vehicles that do not have an intermittent windscreen wiper function. It allows you to adjust the frequency of operation of the windscreen wipers from anywhere between about once every 40 seconds and once every 3 seconds.

Two modes of operation are available

- **Wipe-Park-Pause-Repeat** (seen in most modern vehicles): wipers perform a single sweep, park then pause for the potentiometer-set delay period. This mode is activated using a separate switch (not included).

- **Cycling On-Off**: wipers sweep continuously for the pot-set time then park and turn off for the same time.

Technical Specifications
- Working voltage: 12-14 Vdc
- Current consumption: 40 mA maximum
- Delay Time: 3 to 40 seconds approx.
- Frequency of operation: < 2 to 20 times per minute approx.
- Output current rating: 5 Amps maximum as supplied *

* You can increase the current rating by soldering along the bare sections of the relay tracks. We have not tested how much this will raise the rating by. Bear in mind that the relay has a maximum current rating of 10 Amps.

How it Works
The circuit consists of an operational amplifier U1 which has a very high input impedance because it has a J-FET transistor in its input. This op-amp is a pin to pin replacement for the well-known but old fashioned 741 and can be used in all these applications where it is necessary to have a low biasing current, high input impedance, low transfer time and extended bandwidth.

In this circuit the op-amp is used as a simple timer with adjustable delay time. The time is set by the potentiometer P1. The capacitor C2 charges through the resistor network R5, R4 and P1. The resistor R5 provides the closed loop feedback necessary to the non-inverting input of the op-amp.

As soon as the circuit is connected to a power supply the relay is energised and its contacts close. The capacitor C2 starts charging and when the voltage across it becomes equal to the potential existing in the other input (pin 3) the relay opens. After a while the capacitor starts charging again and the cycle is repeated.

As you see the relay closes for a while, opens its contacts briefly, closes again and so on. The intervals of operation-pause can be adjusted by means of potentiometer P1.

If the Terminals 4 and 5 on the printed circuit board (PCB) are connected together with a switch then the circuit closes the relay and it opens it immediately.

This is very useful if we want the wipers to operate once and then stop for a while before the next operation.

Installation
It is a good idea to familiarise yourself with the boards operation prior to installation. Connect 12Vdc power to Terminals 6 and 7 as shown in the diagram below (make sure the polarity is correct!).
QUASAR CODE # AS8093 - WINDSCREEN WIPER CONTROLLER

Connect a switch to Terminals 4 and 5. You should hear the relay clicking. Adjust the pot to change the delay time. Set the switch to on to select the **Wipe-Park-Pause-Repeat** mode of operation. If you only wish to use this mode you can simply fit a cable link between Terminals 4 and 5.

We strongly recommend that you fit an 100mA inline fuse to the positive supply going to Terminal 7 on the board.

The vehicle connections are:

- Terminals marked 4 and 5 on the board connect to an ON/OFF switch (not supplied) to select the operating mode.
- Terminals 2 and 3 are the relay contacts. The voltage applied to Terminal 2 will be feed to output Terminal 3 when the relay is active. **You must determine if the negative or positive terminal of your wiper motor will be connected to Terminal 3. Use the two connection diagrams below to the establish if positive or negative supply should be connected to Terminal 2.**
- Terminals 6 and 7 should be connected to the positive and negative poles of the car’s electric circuit respectively after the wiper on/off switch (the wipers are going to be controlled by the relay and the wiper switch is now going to control the circuit).
- Terminal 1 is connected to the Normally Closed pole of the relay. It is not normally used. It will be live when power is connected to Terminals 2 and 6 and the relay is off.

If you did everything correctly the circuit should work as soon as you close the wiper switch.

**If it does not work**

Check again all external connections to and from the circuit to see if there is a problem, making sure the supply has the correct voltage and is connected the right way round.

If everything checks out and your project still fails to work, you can contact our support staff at support@QuasarElectronics.co.uk.

Please note that we are unable to provide vehicle specific installation advice. Please consult your vehicle wiring diagram or an auto electrician.

**Circuit Diagram**
QUASAR CODE # AS8093 - WINDSCREEN WIPER CONTROLLER

Connection Diagram 1 – Wiper Motor POSITIVE (+) Connected to Terminal 3

NOTE! Connect vehicle POSITIVE (+) to Terminal 2

Connection Diagram 2 – Wiper Motor NEGATIVE (-) Connected to Terminal 3

NOTE! Connect vehicle NEGATIVE (-) Terminal 2