MINITRON

Immobiliser

User Manual

An immobiliser device designed for your classic vehicle.

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MINITRON Immobiliser User Manual

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General Features

- Automatically activates when the ignition is turned off
- Unset with Remote Key Fob (or a manual switch as an option)
- Consumes no current when activated
- Supercapacitor powered flashing LED indicator
- Positive and negative earth 12V vehicles

Gives you:

- Peace of mind
- Increased security
- Convenience

Fig. 1 MINITRON Immobiliser Control Module.

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1. Introducing the MINITRON Immobiliser

The MINITRON Immobiliser is an electronically controlled relay which is activated (Set) automatically when the vehicle ignition is turned off and deactivated (Unset) using a Remote Key Fob, or a manual switch, when power when the ignition is turned on. The 8A relay contacts inside the unit can be used to control the current to the vehicle's ignition coil or some other custom purpose.

The intended function of the device is to act as an engine immobiliser.

A particular feature of the MINITRON Immobiliser is that despite being electronically controlled, it draws no power at all when set and the ignition turned off thus making the system suitable for vehicles in long term storage or which are seldom used. The LED status indicator is powered by supercapacitors and remains visible for about two hours after entering the Set state and acts as a short-term visible deterrent.

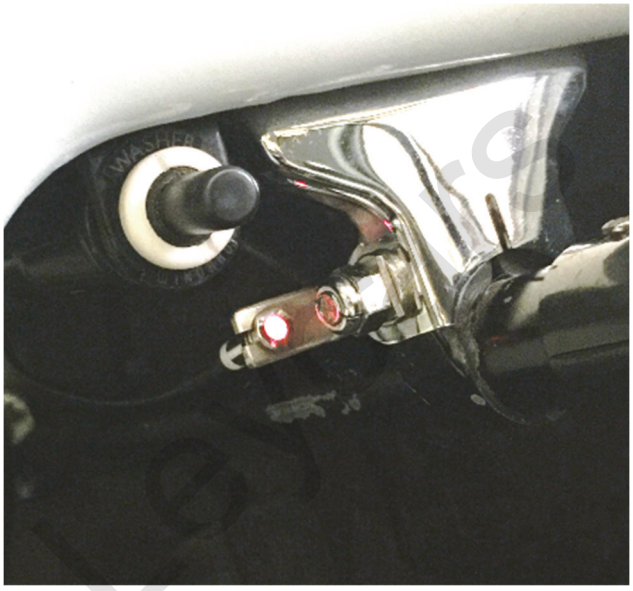

Fig. 2 Installation of Indicator LED.

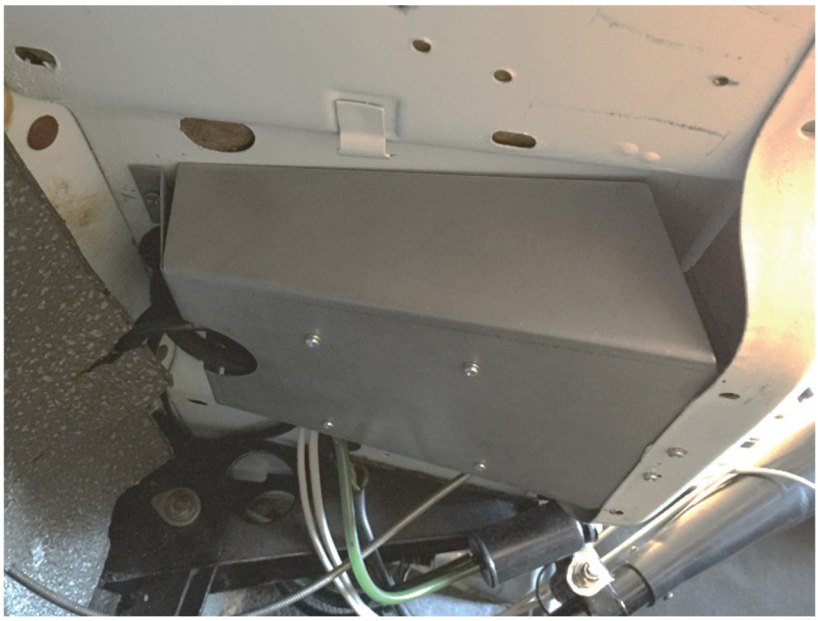

Fig. 3 MINITRON installation under parcel shelf with optional switch shield.

An optional solar cell may be connected to keep the supercapacitors charged for longer term display of the LED status indicator if lighting conditions permit.

Vehicle Immobilisers may often be designed to conform to Australian and New Zealand Standard AS/NZ 4601. The MINITRON Immobiliser has been designed to conform with the code wherever possible, but the Code does not cover some features of the MINITRON, nor in fact does it cover some aspects of an original equipment immobiliser on more modern vehicles.

For older vehicles, the ignition, fuel, and starting systems are usually the only options for immobilisation. The instructions given here apply to a 1962 Morris 850. The instructions would apply to similar vehicles of this era.

For vehicles with an electric fuel pump, it is tempting to control the fuel pump with the immobiliser circuit. However, in doing so, the vehicle may still be driven under its own power while the carburetter float bowl

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contains fuel and this presents a significant risk to public safety should an unexpected engine stall occur while in traffic should the vehicle be driven while the MINITRON remains Set and so this practice should be avoided.

All the necessary relays are built into the MINITRON Immobiliser and do not have to be purchased and installed separately.

Basic operation is:

- When leaving the vehicle, just turn the ignition off. MINITRON sets automatically.
- When returning to the vehicle, turn the ignition on, press the Remote button, and then operate the starter as normal.
- Red/Green LED indicates the state of the system and also acts as a short-term visible deterrent.

Think of the MINITRON immobiliser as a secondary ignition switch that has to be turned on (Unset) after the vehicle's normal ignition switch is turned on before the engine can be started.

The following design features increase the security and safety of the MINITRON Immobiliser:

- Designed to be optionally mounted in a metal switch guard (for Morris Mini).
- OEM quality wiring and construction.
- Natural grey colour enclosure designed to look like a factory fitment rather than an added accessory.

The MINITRON Immobiliser is a high-quality product made from trusted brand-name industrial-grade electronic components and materials.

Such is our confidence in this product, the MINITRON Immobiliser is warranted for **three years** from date of purchase.

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Feature Table

	MINITRON	Notes
Immobiliser functions	Relay	Relay connections to terminals rated at 8A.
Auto Set	Yes	Automatically sets the Relay when the ignition is turned off.
Auto Reset	No	Not applicable: The MINITRON can only be Unset when the ignition is turned on.
Unset	Yes	Unset with a Key Switch or Remote Fob.
Current consumption when Set	Zero after ignition is turned off.	Red LED indicator powered by supercapacitors for about two hours when turned off.
Current consumption while Unset (ignition on)	<100mA	80mA current consumption during normal operation. Momentary current consumption of 100mA during charging of the supercapacitors.
AS/NZ 4601 compliant	Partial	Largely meets the requirements of AS/NZ4601 but some features of the MINITRON are not covered by this Standard and MINITRON does not meet all requirements of the Standard.

Requirements

- 12V positive or negative earth electrical system.
- An available connection to a switched battery feed terminal in the vehicle (via piggy-back spade terminal supplied).

Important: Some vehicles disconnect accessory circuits while the starter is being used. The switched battery feed terminal used for the MINITRON must remain powered when the starter motor is operated. If this is not the case, then the MINITRON is not suitable for your vehicle.

Options

- Switch Shield for Mini saloon and van vehicles prior to 1971 (pre-Clubman body style).
- Solar cell (100mm square) to keep the supercapacitors charged.
- Seamless integration with the MINITRON Fuel Pump Safety Module to allow an extra measure of safety in the event of an engine stall

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with the ignition on for vehicles with an electric fuel pump. The Fuel Pump Safety Module can optionally be integrated inside the MINITRON Immobiliser at time of purchase.

2. Description

The MINITRON Immobiliser is designed to offer a security function for older motor vehicles with conventional ignition and starting systems. It is suitable for fitting to both 12V positive and negative earth vehicles. It is not suitable for 6V vehicles.

The MINITRON relay can be used to control an external circuit such as ignition and starter circuits. When “set”, the relay contacts are open. When “unset” the relay contacts are closed. The intended function is to prevent the vehicle being driven under its own power while the MINITRON is in the Set state.

3. Operating the MINITRON Immobiliser

3.1 Operation

There is a Red/Green indicator LED that indicates the connections of the main relay terminals inside the unit.

Flashing Red, Ignition Off	MINITRON Relay in the Set state and the required circuits deactivated as desired.[1]
Flashing Red, Ignition On.	MINITRON Relay is in the Set state. Flashing red indicator reminds the driver to Unset the MINITRON before attempting to start the engine.
Green, Ignition On.	MINITRON Relay is in the Unset state. Normal driving condition.
Green, Ignition Off.	MINITRON Relay is in the Unset state. The driver has pressed and held down the Unset button while turning

[1] **Note**: the LED only shows flashing Red for about two hours after entering the Set state because during that time, the LED is powered by two supercapacitors. The intention of the Red LED indicator is that the operator may verify that the System is in the Set state before leaving the vehicle. The Red Indicator LED also acts as a short-term deterrent. A solar cell may optionally be connected to keep the supercapacitors charged and the LED flashing.

	off the ignition. When this happens, the unit remains in the Unset state.
Flashing Orange/Green, Ignition On.	When the Fuel Pump Control module is fitted, the LED flashes orange/green if the Immobiliser is in the Unset state and there is no oil pressure. This indicates that the vehicle's electric fuel pump is disabled.

The MINITRON will automatically Set when the ignition is turned off. There is no delay period, and no secret switches to remember to turn on.

> **Note**: The MINITRON will not enter the Set state if the ignition is on. However, once it enters the Set state (as the ignition is turned off), it will remain in the Set state even if the ignition is then turned on again. The System can only be unset after the ignition is turned on. There is no master Unset or Reset function.
>
> **Note**: If the Unset button is held down as the ignition switch is turned off, the MINITRON will remain in the Unset state and the LED will glow steady green to indicate this.

There are several installation options for putting the MINITRON into the Unset state. The Ignition must be switched on for the unit to enter the Unset state. Details of the manual key switch and radio controlled remote key fob are given in the Appendix.

3.2 Testing

The MINITRON may be in the Set or Unset condition upon delivery. After installation, turn the ignition on for about 30 seconds, and then off. The Indicator LED should be now flashing Red (the ignition has to be turned on for a short time to give the supercapacitors time to charge up otherwise LED will not flash red or flash very dimly). If the indicator does not flash red, then it is most likely because the supercapacitors are not yet charged.

With the ignition then turned on again, press the Key Fob or operate the Key Switch. The Indicator LED should now be Green. There should also be an audible click from the relay inside the MINITRON control unit.

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4. General Features

The MINITRON Immobiliser is suitable for both positive and negative earth operation without any internal modification or settings. The White power wire always goes to the vehicle Switched battery feed connection (at the ignition switch), and the Black power wire always goes to vehicle earth no matter what the vehicle polarity.

The MINITRON Relay has contacts rated at 8A.

5. Specifications

5.1 Power Consumption

The MINITRON draws no current at all from the vehicle battery when it enters the Set state when the ignition is turned off. The indicator LED is powered by supercapacitors when the ignition is turned off. Operating time for the LED is about two hours with fully charged capacitors.

During Set and Unset, power consumption may increase up to 100 mA momentarily while the relay is being activated. During normal operation with the ignition on and engine running, current consumption is about 70-80mA.

5.2 Wiring

The 18 AWG primary wires to and from the MINITRON relay contacts are rated at 7.5A continuous use and are to original Lucas equipment specification.

6. Fitting Instructions

The MINITRON Immobiliser control module is designed to be mounted inside the vehicle, not in the engine compartment. The case of the module does not have to be earthed. The Immobiliser Module automatically adjusts for both positive and negative earth installations.

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6.1 Requirements

- Standard ignition system with points, condenser and coil. (Note, some electronic ignition systems can be accommodated.
- Front parcel shelf with no accessories under the switch panel area that would prevent installation of the optional Switch Shield if this is to be fitted. If a heater or radio is installed, then make sure that the shield will not interfere with these units.
- Under-shelf wiring in good condition with no loose, exposed wires or frayed insulation.

When installing the MINITRON, please take your time to do a good job. A rushed job will result in frustration, poor appearance, and a possible dangerous situation with the risk of a short circuit and unreliable function.

Please follow these instructions carefully. Allow about 3 hours for installation. Allow substantially more time if there is a heater or under-dash radio fitted and the optional Switch Shield is being installed.

6.2 Safety Considerations

Ensure that all electrical connections are reliable and firm.

Ensure that all wiring is secured and not likely to get caught up in the wiper rack, or brake and clutch pedals.

Ensure that the wires passing through the parcel shelf do not chafe on any metalwork – that is, the grommet at the bottom of the speedometer housing must be correctly fitted and in good condition.

If power is inadvertently lost at the MINITRON power cables due to poor connections, then the unit will immediately enter the Set state and the engine will stall unexpectedly.

When in operation, the relay circuits inside the MINITRON unit are slightly energised so that there is no possibility of the unit entering the Set state arising from mechanical shock while driving. An addition fail-safe circuit disables the Set state while the ignition is turned on.

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6.3 Installation

Not shown in this public document.

7. Trouble Shooting

The circuitry inside the MINITRON is protected against reverse polarity, over-voltage, and short circuits.

The MINITRON is designed for 12V operation but will operate with as low as 10 volts. Below 10V, there may be insufficient charge in the internal components to operate the Relay.

> **Note**: The power to the MINITRON unit should be taken from an unfused switched battery feed circuit. If power is taken from a fused circuit, then if the fuse blows due to a malfunction of a vehicle component downstream of the fuse (e.g. the wiper motor), then this will be registered as if the ignition were turned off and the MINITRON controller will enter the Set state with unintended consequences. This is a safety hazard**.** When connected to an unfused switch ignition terminal, the MINITRON unit will not enter the Set state if the ignition is on (e.g. if the engine is running). There is internal short circuit protection inside the MINITRON unit (auto-reset polymer fuse).

If the system is put into the Set state but the red LED is not flashing, then this is probably because the supercapacitors haven't had enough time to accumulate a charge and power the LED. The MINITRON unit has to be powered for about 10 minutes to fully charge the supercapacitors for LED display.

There should be no buzzing sounds or sparks visible, nor any smell of over-heated wires. If any of these occurrences happen, then turn off the ignition immediately and investigate. When operations, the MINITRON module should issue an audible click when the relay operates.

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8. Questions

1. Is it suitable for both **positive and negative earth** vehicles? Yes. The black wire goes to the vehicle earth, the white wire to the vehicle switched battery feed for both positive and negative earth.
2. Can it be used with **electronic ignition**? It is possible, depending on the type of system. The Application Note provides full details of suggested wiring for the MINITRON. You will have to do your own research to determine suitability with your ignition system.
3. Is there a **warranty**? Yes. MINITRON is warranted to be free from defects arising from manufacture for a period of **3 years** if the installation and operating instructions are followed. Faulty units are to be returned at Purchaser's expense and will be examined and warranty status advised. Repaired or replaced units will be returned at our expense. Repairs arising from any damage arising from incorrect installation, misuse, water ingress, is not covered under warranty but a repair cost will be quoted.

9. Warranty

The Manufacturer hereby warrants this MINITRTON Immobiliser to be free from defects in materials and/or workmanship for a period of 3 years from date of purchase by the original purchaser.

Our obligation under this Warranty is limited to repairing or replacing faulty parts or materials and does not extend to consequential loss, damage or injury arising from the use of the device.

This Warranty does not cover faults that are due to misuse, abuse, negligence, accident. Also excluded are faults arising from unauthorised repair, use not according to instructions, and normal wear and tear.

Returns under Warranty must be freight-prepaid and must be accompanied by proof of the purchase date.

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The rights and conditions under this Warranty are additional to any rights that may be conferred under the NSW Consumer law.

10. Disclaimers

Great care has gone into the design and manufacture of the MINITRON so as to provide the best possible security and safety for your vehicle. However, due to the wide range of operating conditions and circumstances that might be encountered during service, the manufacturer or retailer does not guarantee your car against fire or theft even if the MINITRON Immobiliser is fitted and functioning correctly.

11. Conditions

The fitting and usage instructions must be followed.

Any vehicle system controlled by the MINITRON relay contact terminals are the owner's responsibility and no responsibility for any consequences of the use and application of these circuits will be accepted by the Manufacturer.

Altering the product or not adhering to the fitting instructions will void the warranty.

Fitment and use of the MINITRON signifies your acceptance of the above conditions.

12. Regulatory

The MINITRON Immobiliser generally complies with AS4061 for vehicle immobilisers and is constructed with ROHS compliant components. Areas which are not compliant are as follows:

- AS4061 requires that the indicator be visible from inside and outside the vehicle while in the Set state. Although the indicator is visible, in the MINITRON system, the indicator is extinguished after the charge in the supercapacitors is depleted (approx. 2 hours from

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full charge). A longer period may be obtained using the optional solar cell if conditions (sunlight) permit.

- AS4061 requires that the Immobiliser re-enter the Set state if the System is unset, but the ignition is not turned on after a certain time. i.e. automatic reset. In the MINITRON, there is no automatic "reset" function, since the unit can only be unset once the ignition is turned on, and the unit cannot enter the Set state when the ignition is on.

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Appendix 1. Wiring Diagram

Suitable for Morris 850/Deluxe/Cooper S with generator

Not shown in this public document.

Fig. 11 MINITRON main connections Morris 850 and Deluxe.

Appendix 2. Unsetting Options

Not shown in this public document.

Appendix 3. Solar Cell

An optional solar cell is available. This connects to the MINITRON via a USB connecting cable. The solar cell servers to charge the supercapacitors when the cell is exposed to sunlight. This keeps the MINITRON flashing Red LED activated for a longer period than is possible just using one charge of the supercapacitors.

To fit the solar cell, simply plug in the USB cable to the MINITRON Auxiliary Power connector.

Place the solar cell panel (95mm square) on the vehicle parcel shelf.

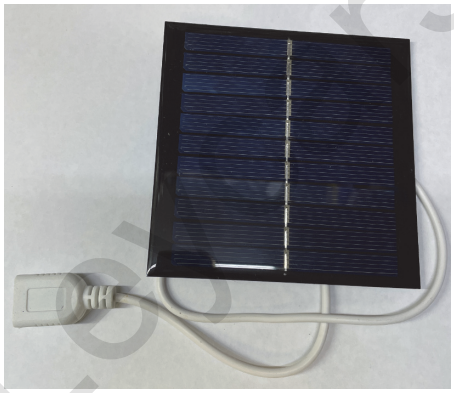

Fig. 14 Solar Cell panel.