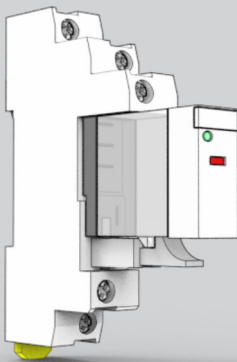


Installation Guide

RK-1 Relay Kit

V1.2



HISTORY

VERSION	DATE	DETAILS
1.0	19-Jun-19	1 st edition
1.1	08-Apr-22	Updated to suit SB and ST series products
1.2	08-Apr-22	Warranty add clause 5(p)

NOTICE OF COPYRIGHT

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PRIVACY NOTICE

Redback will use the information provided only for warranty purposes. Without this information we will not be able to process your warranty claim. If you require further information about our privacy policy, please visit our website at redbacktech.com.

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Important safety instructions

This document contains important safety instructions for products produced by Redback Technologies. Please read this installation guide thoroughly before commencing installation. Failure to follow instructions may result in severe shock or electrocution. Use extreme caution to prevent accidents.

Audience

These instructions are for use by qualified personnel who meet all local and governmental code requirements for licensing and training for the installation of electrical power systems with AC and DC voltage up to 600 volts. Installation, maintenance, and connection of Inverters must be performed by qualified personnel, in compliance with local electrical standards, wiring rules and the requirements of local power authorities and/or companies (for example AS/NZS 3000 in Australia).

Redback products strictly conform to all related safety rules in design and test.

Safety regulations relevant to the location should be followed during installation, operation, and maintenance. Improper operation may have a risk of electric shock, injury or damage to persons, equipment, or property.

General safety



WARNING! Hazard to life

Use standard safety practices when working with electrical equipment. (Remove all jewellery, use insulated tools, wear cotton clothing etc).

Never work alone when installing or servicing this equipment. Have someone nearby that can assist if necessary.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



CAUTION: Equipment damage

Only use components or accessories recommended or sold by Redback Technologies or its authorised agents.



IMPORTANT

Do not attempt to install this equipment if it appears to be damaged in any way. See the Warranty section for instructions on returning the equipment.

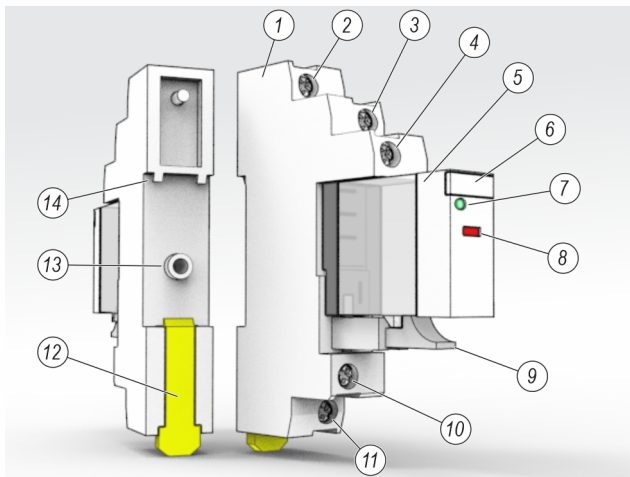
1. Introduction

1.1 Know your product

The RK-1 Relay Kit is an accessory for the Redback SB-series Smart Batteries and ST Smart Hybrid 3-phase Inverters. The kit enables programmed or remote control of up to three connected circuits and attached devices e.g., pumps or hot water can be scheduled during daylight hours to consume excess solar.

SB and ST products can control up to three relays.

SH5000 Smart Hybrid inverters have two built-in relays. Please refer to the [SH5000 Installation Manual](#) for connection and configuration information.



# PART	# PART	# PART	# PART	# PART
1 Relay base	4 Terminal 3 (14)	7 Status LED	9 Relay eject lever	12 DIN rail clip
2 Terminal 4 (11)	5 Relay assembly	8 Mechanical position indicator	10 Terminal 5 (+)	13 Face mount hole
3 Terminal 2 (12)	6 Nameplate	11 Terminal 1 (-)	14 DIN rail hook	

1.2 Application

- Use the RK-1 Relay Kit with Redback SB or ST products.
- Control individual circuits (devices) that require multi-event schedules or remote control.
- Switch loads up to 10A@240VAC. Larger loads require the use of a secondary relay (not supplied).

1.3 Installation requirements

- The RK-1 Relay is not waterproof. Install the relay at the main switchboard, sub-board or in a suitable enclosure.
- Connect the Redback inverter to the relay using Cat5 ethernet cable. The installer is to fabricate or supply the cable.

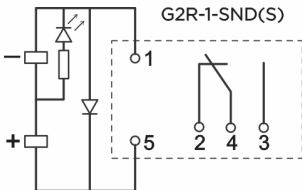
1.4 Tools required

- Electrician's tools
- Cat5 Network Cable Kit

1.5 Kit contents

- Omron Relay/Base to suit 35mm DIN Rail
- Relays-to-Ethernet adaptor (R1+, R1- etc)
- Installation Guide with Warranty Policy

1.6 Relay Schematic

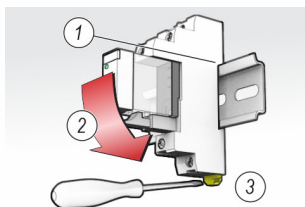


2. Installation

2.1 Mount the relay

Install the relay in the Main Switchboard, Sub-board or a suitable enclosure. Mount the relay on a 35mm DIN Rail using the integrated clip.

1. Hook the relay onto the rail.
2. Rotate until the latch clicks.
3. If required, release the latch using a suitable pry tool.

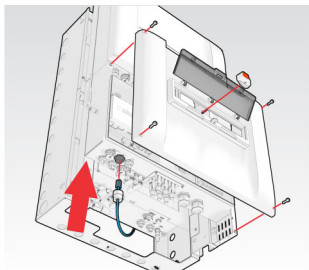
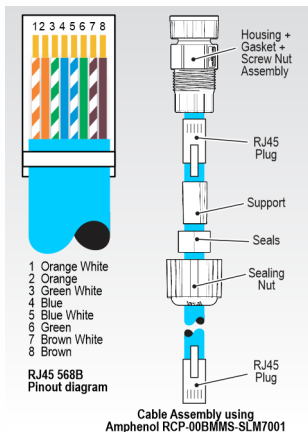


2.2 Route and fabricate the relay cable

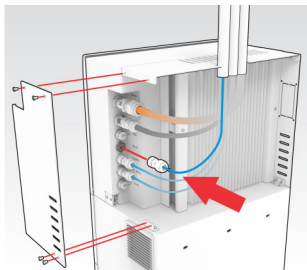


Caution: Lethal Voltage inside cabinet.

1. Route Cat5 ethernet cable from the Relay to the Redback System, making the cable as short as practical and not more than 10m long.
2. At the relay end, terminate the cable with a RJ45 plug, configured 586B straight-thru as shown right.
3. **For ST systems** remove the BoS front cover and route the cable behind the system to emerge at the bottom of the BoS. Remove the cap from the Relay port, toward the left.
4. **For SB systems** remove the right-hand side cover and route the cable behind the inverter or down through the conduit port, and toward the connector array.
5. Terminate the system end of the cable using Amphenol RCP-00BMMS-SLM7001.
6. Configure as RJ45; 586B straight-thru.
7. Insert the plug into the Relay port and tighten the gland.
8. Replace the front or side cover.



RK-1 to ST10000 Connection



RK-1 to SB-series Connection

3. Relay connections (all systems)

The relay can directly control loads up to 10A@240V AC and can be connected or configured to achieve Normally ON or Normally OFF, and to control loads over 10A.

Loads up to 10A@240V AC

- Connect the load directly as shown right.
- During installation, in the RedbackINSTALL app, rename the relay to include its default state e.g., HWS Normally OFF, and set the default state to match—changing the default state will change the scheduling from ON/OFF to OFF/ON.

Loads over 10A@240V AC

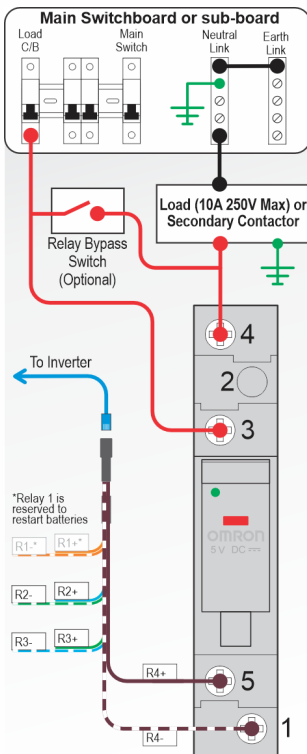
Loads over 10A@240V AC must be controlled using a secondary contactor (installer to supply).

- At the secondary contactor, mechanically configure or select the contactor to be Normally ON or Normally OFF as required. This will ensure the relay returns to the normal state if the inverter is off.
- Connect the RK-1 relay as shown right.
- In the app, configure the RK-1 to match the secondary relay i.e., Normally OFF or Normally ON.
- Set the schedules as required.

RK-1 connection

Connect relays as shown right.

- Do not connect R1 leads: R1 is already assigned internally for BMS restarting.
- In the app and portal:
 - R2 is aliased as "Relay 1 (RK2)"
 - R3 is aliased as "Relay 2 (RK3)"
 - R4 is aliased as "Relay 3 (RK4)"



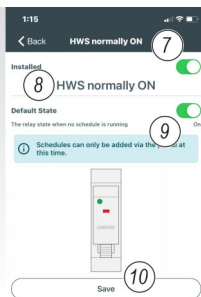
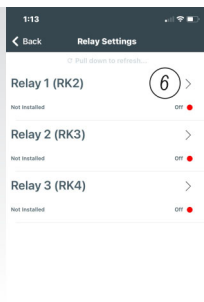
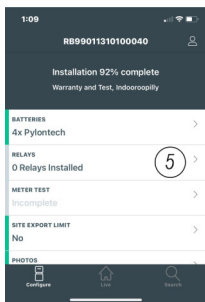
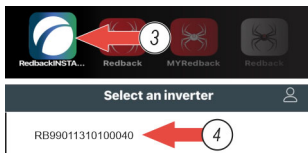
4. Enable the Relay

Installers must enable relays otherwise they are not available for control or scheduling, or visible to the owner. The relay is enabled using the RedbackINSTALL app or the Portal.

Control and schedule the relays as described in the next section.

RedbackINSTALL app

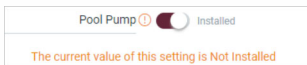
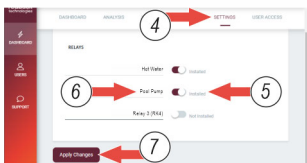
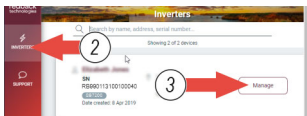
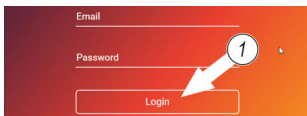
1. Press the EMS restart button
2. Wait for the EMS icon to begin flashing, indicating Bluetooth is advertising.
3. Open the RedbackINSTALL app
4. Connect to the inverter.
5. Navigate to Relay Settings.
6. Select the relay to be activated.
7. Toggle Installed ON
8. Edit relay name if required
9. The default configuration is Normally OFF. Change status to Normally ON if required. Note: This change can only be made in the app, on-site, while connected to the inverter.
10. Save if finished.



Redback Portal

Note: If Normally ON configuration is required, use the RedbackINSTALL app.

1. Login to **portal.redbacktech.com**
2. Go to the **Inverters** tab
3. Locate the inverter and **Manage**
4. Open the **Settings** tab. Scroll to the **Relays** section
5. Identify the relay to be enabled. Change status to **Installed**.
6. Rename the relay as required.
7. Scroll down and **Apply Changes**. An error message may appear as the system takes a few minutes to refresh.



5. Relay control and scheduling

Each relay controls a circuit and load, with its own switching schedule, enabling owners to move selected energy consumption to the most beneficial time. Control options include:

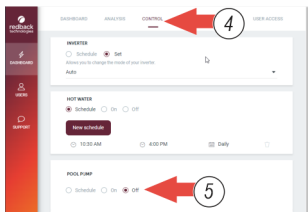
- Turn relays ON or OFF manually.
- Schedule one or more unique events.
- Schedule daily, recurring events.

Notes:

- Manual control overrides and deletes all existing schedules, without warnings.
- Relays must be enabled prior to control or scheduling.
- Relays configured Normally ON switch OFF/ON; Normally OFF switch ON/OFF
- The Redback system must be internet connected to receive schedules. The schedules are stored on the inverter, and events occur even if the internet is lost.

5.1 To access control and scheduling

1. Login to **portal.redbacktech.com**
2. Go to the **Inverters** tab
3. Locate the inverter and **Manage**
4. Open the **Control** tab. Scroll down to the **Relays** section
5. Identify the relay to be controlled.



5.2 Manual control on Portal

Caution. Selecting Manual ON or OFF erases all saved schedules when saved.

To switch the load manually:

1. Select the required **radio button**. If the relay has been correctly configured, the load will switch ON or OFF as indicated.

POOL PUMP

☐ Schedule
 ☐ On
 ☒ Off

2. Click **Save** to send the command to the inverter.
3. Test the installation thoroughly to ensure it works as expected.

5.3 Scheduling on the Portal

Schedules are single timed events. Events can be once-only or recurring daily. Multiple events are permitted.

To add a new event:

1. Login to **portal.redbacktech.com**
2. Select the **Inverters>Control** tabs
3. Scroll to the target relay
4. Select **Schedule > New schedule**
5. Select the start and finish times
6. Toggle **Once** to **Daily** if a recurring schedule is required
7. Click **Add Schedule**
8. Click **Save** when scheduling changes are complete.

The screenshot illustrates the steps to add a new schedule on the Redback Technologies portal. The interface shows the 'INVERTERS' sidebar (2), the 'CONTROL' tab (2), and the 'RELAY1' control panel. The 'Schedule' radio button is selected (4), and the 'New schedule' button is clicked. A 'NEW SCHEDULE' modal is open, showing the 'Time From (HH:MM AM/PM)' (5) field with a time picker set to 11:00 AM. Below this, there is a note about E. Australia Standard Time, a 'Run the schedule' section with a 'Daily' toggle (6), and 'Add schedule' (7) and 'Save' (8) buttons.

6. Specifications

PHYSICAL PROPERTIES

Dimensions (mm)	15.4w x 85.0d x 65.0h (½ DIN)
Mounting system	35mm DIN Rail (IEC 60715);integrated clip

CONTACT RATINGS

Number of poles	1 pole	
Load	Resistive load ($\cos\Phi = 1$)	Inductive load ($\cos\Phi = 0.4$; $L/R = 7\text{ms}$)
Rated load	10 A at 250 VAC; 10 A at 30 VDC	7.5 A at 250 VAC; 5 A at 30 VDC
Rated carry current	10 A	
Max. switching voltage	440 VAC, 125 VDC	
Max. switching current	10 A	
Max. switching capacity	2500 VA 300 W	1875 VA 150W
Min. permissible load	100mA at 5 VDC	

Note: P level: $\lambda_{60} = 0.1 \times 10^6/\text{operation}$

WIRE ASSIGNMENTS (568B)

Label	Colour	Comment
R1-	Orange White	Not user controlled.
R1+	Orange	Reserved for system battery starting.
R2-	Green White	
R2+	Blue	
R3-	Blue White	
R3+	Green	
R4-	Brown White	
R4+	Brown	

7. Warranty

1. Introduction

- 1.1 This warranty is provided by Redback Operations Pty Ltd (ACN 605 542 541) of Building 1015, 80-120 Meiers Road, Indooroopilly QLD 4068, Australia.
- 1.2 Nothing in this document limits or is intended to limit your rights or remedies under the Statutory Guarantees of the Australian Consumer Law, or any equivalent laws in New Zealand.
- 1.3 Note for Australian consumers only: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. These rights apply regardless of anything set out below.
- 1.4 Redback Operations Pty Ltd (herein known as Redback) makes no other express warranty or condition whether written or oral.
- 1.5 For the purpose of this warranty document, customer means end-user of the Product.

2. What does our warranty cover?

- 2.1 This warranty applies to the Redback Product listed on the cover page and manufactured on or after 1st January 2022 and installed in Australia by an accredited CEC installer and in New Zealand by a licensed electrician.
- 2.2 The warranty only covers the Redback Product if it is installed and used in accordance with the terms and conditions set out in Redback's Product Installation Manuals and Guidelines. Redback's Installation Manuals and Guidelines include all documentation supplied with the Redback Product and contained on our website and portal at redback.link/docs.
- 2.3 This warranty excludes specific causes of failure that are set out below in clause 5 of this document.

3. What is our warranty period?

- 3.1 The warranty period is 12 months from the date of installation.

4. Under what circumstances can a warranty be claimed?

- 4.1 If the Redback Product fails to be of acceptable quality and the failure does not amount to a major failure, Redback will repair or replace the defective Redback Product either:
 - (a) onsite by a Redback technician or suitably qualified technician; or
 - (b) offsite at an authorized Redback repair facility.
- 4.2 What is considered a 'major failure'?

A major failure is defined as noncompliance with the relevant Australian Consumer Law guarantees and includes:

- (a) the goods would not have been acquired by a reasonable consumer fully acquainted with the nature and extent of the failure; or
- (b) the goods depart in one or more significant respects:
 - (i) if they were supplied by description - from that description; or
 - (ii) if they were supplied by reference to a sample or demonstration model - from that sample or demonstration model; or
- (c) the goods are substantially unfit for a purpose for which goods of the same kind are commonly supplied and they cannot, easily and within a reasonable time, be remedied to make them fit for such a purpose; or
- (d) the goods are unfit for a disclosed purpose that was made known to:
 - (i) the supplier of the goods; or
 - (ii) a person by whom any prior negotiations or arrangements in relation to the acquisition of the goods were conducted or made; and

- (iii) they cannot, easily and within a reasonable time, be remedied to make them fit for such a purpose; or
- (e) the goods are not of acceptable quality because they are unsafe.

5. What is not covered

This warranty does not cover any direct or indirect loss or damage to the Redback Product or any other appliance, equipment, service or property caused by:

- (a) failure to install or operate the Redback Product in accordance with the Installation Manuals or Guidelines;
- (b) failure by the customer to maintain a stable connection to the Redback cloud for greater than 3 months;
- (c) an off-grid installation where there is an installation at a premises that is intentionally unable to receive energy from a low voltage distribution network;
- (d) unauthorised repair or alteration of the Redback Product including unauthorised substitution of non-standard parts or repair attempts;
- (e) connection of Redback Product to a photovoltaic system that is non-compliant or non-compatible with the Redback Product as per Redback Installation Manuals and Datasheets;
- (f) connection of Redback Product to any non-approved third-party products, including but not limited to battery modules, inverters, or charge controllers;
- (g) force majeure events (including war, acts of terrorism, nuclear accident, industrial action, earthquake, flood, fire, cyclone, storm, lightning or other physical natural disaster);
- (h) failure to provide proper ventilation, or follow maintenance instructions on PV systems which could affect the Redback Product operations;
- (i) abuse, misuse or negligent acts, voltage variations, power surges, overvoltage;
- (j) pest or other vermin damage, insect infestation, accidental breakage, corrosion, actions of third parties and other events or accidents outside Redback's reasonable control which are not arising from normal operating conditions;
- (k) failure to carry out all AC/DC wiring in accordance with relevant wiring rules and standards;
- (l) incorrect or inadequate packaging (if removed from standard packaging materials);
- (m) failure to comply with any safety regulations, installation standards and guidelines or CEC standards and guidelines;
- (n) improper storage, (if the unit is to be stored prior to installation it must be kept in dry clean conditions so damage to the Redback Product or packaging is avoided); or
- (o) transport damage (including cosmetic damage, such as paint scratches, caused by movement inside packaging during shipping); or
- (p) utilization of the Smart Relay function.

6. Warranty transfer

- 6.1 This warranty is transferable to a new owner provided the Redback Product remains installed at the original location. This means, if the customer sells their property which has a Redback Product installed, the new owners of the property will continue to enjoy the benefit of the remaining warranty protection from the original date of installation until its expiry. In order to receive this protection and to keep the warranty valid, the new owner of the property must register as the new owner of the Redback Product by contacting Redback. The warranty will only apply in respect to the normal application and installation in accordance with Redback's Installation Manuals and Guidelines. The warranty will be invalid if the Redback Product is removed and reinstalled at a new

14 Warranty

location without Redback's prior, written approval.

- 6.2 If any components are replaced under warranty, they receive the benefit of the remaining warranty period from the original date of installation of the Redback Product until its expiry.

7. How to lodge a warranty claim?

In the event of a claim, the following steps should be taken:

- (1) In the first instance, you should contact your installer for support.
- (2) Your installer will attend, investigate and diagnose issues and, if necessary, contact Redback for assistance.
- (3) In the event a warranty claim is required, your installer will lodge a claim on your behalf directly with Redback Customer Support.
- (4) A warranty claim will be accepted if all criteria can be met and a fault found.

- 7.2 All warranty claims require information to be provided to Redback upon request. Information required may include:

- (a) customer name and address;
- (b) serial number of affected unit;
- (c) proof of purchase and proof of installation by a qualified installer;
- (d) type of battery and quantity installed (if applicable);
- (e) failure date;

- (f) complete details relating to the failure to allow technical assessment to be carried out; and

- (g) inverter data and analytics (requires internet connection).

You are required to contact your installer, supplier or Redback with any claims. DO NOT attempt to repair the Redback Product yourself or return the Redback Product without prior, written authorisation as the claim may be denied.

8. What costs are payable in case of a rejected claim?

- 8.1 If the claim is rejected after the Redback Product has been tested, you may be required to reimburse Redback all costs associated with the claim. Redback will issue you with an invoice.

9. What if the customer is not satisfied with the outcome of claim?

- 9.1 If you are not satisfied with the outcome of the claim, a request for review may be lodged with Redback by contacting Redback directly, explaining the grievance and providing any further evidence to support the grievance.
- 9.2 Upon receipt of any requests for review, Redback will review any additional information that is provided by you and respond within 15 business days, detailing the outcome and/or any proposed action.

Contact: Redback Technologies

Phone: International: 1300 240 182
+61 7 3180 2325

Address: Building 1015,
80-120 Meiers Rd,
Indooroopilly, QLD 4068 Australia

Email: customersupport@redbacktech.com
Web: redbacktech.com