MICRO CARE

4 - CHANNEL RELAY
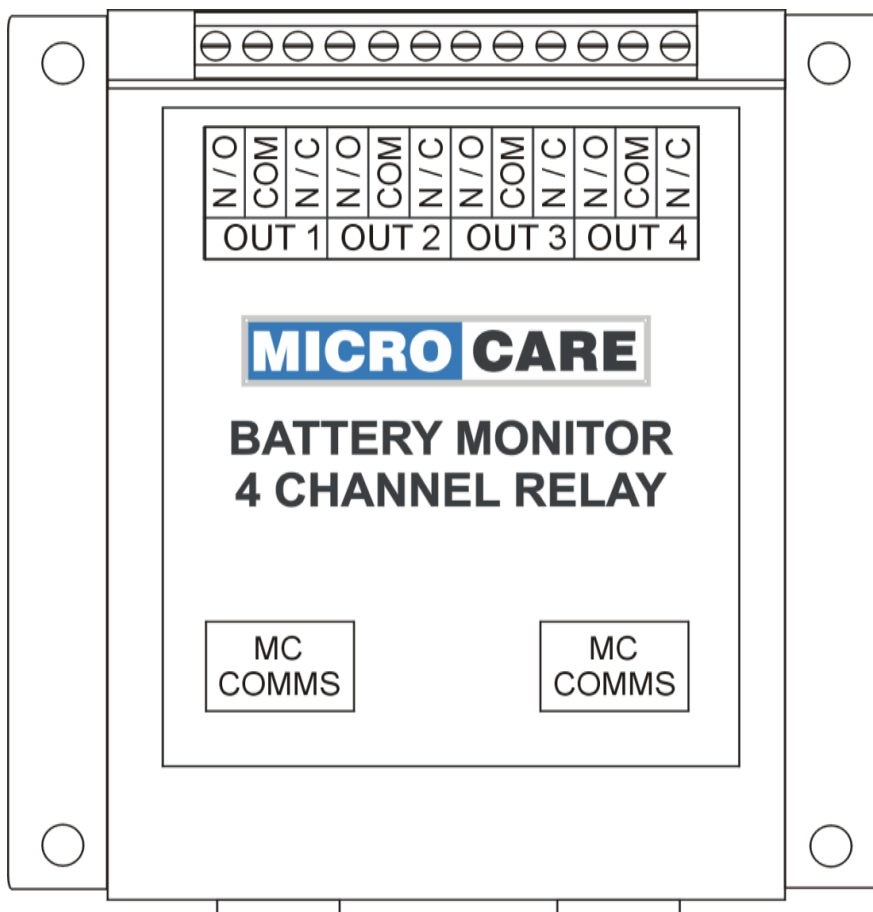
User Manual

MICRO CARE

BATTERY MONITOR
4 CHANNEL RELAY

OUT 1 | OUT 2 | OUT 3 | OUT 4

N/O COM N/C | N/O COM N/C | N/O COM N/C | N/O COM N/C

MC COMMS   MC COMMS

Table of Contents

1. IMPORTANT INFORMATION

- Installers should be qualified electricians or technicians
- The installation information in the manual is for information purposes only.
- Connection and installation instructions must be followed.
- The unit should only be opened by skilled personal.
- Retain the load within the rating of the relay outputs.
- Sketches are intended for illustrative purposes only and are not intended to provide an electrical design.

2. INTRODUCTION

2.1 General Description

The Microcare Battery Monitor 4 Channel Relay is designed to be used in conjunction with the Microcare Battery Monitor and Battery Sensor. The 4 relays are digitally controlled by the Battery Monitor and allows load connect/disconnect capabilities of up to 4 x AC loads @ 10A per channel

The AC Loads can be connected/disconnected by using any of the following Battery Monitor programmable options:

- Forced State
  "FRC_ON" (Force On) – The relay is on permanently.
  "FRC_OFF" (Force Off) – The relay is off permanently.

- "SOC" (State of Charge)
  The relay is controlled by the state of charge (SOC) of the battery.
  For Example: When the battery only has 20% remaining, it may turn off.

- "VOLT" (Voltage)
  The relay is controlled by the battery voltage.
  For Example: When the battery reaches 11 Volts, the relay will turn off.

- "TOD" (Time of Day")
  The relay is controlled by the time of the day.
  For Example: The relay will turn on at 5 o'clock and turn off at 7 o'clock.

- "TTG" (Time to Go)
  The relay is controlled by the time to go in the battery.
  For Example: The relay will turn off if there is less than 8 hours of run time in the battery.

3. OVERVIEW
3.1 4 Channel Relay Front View
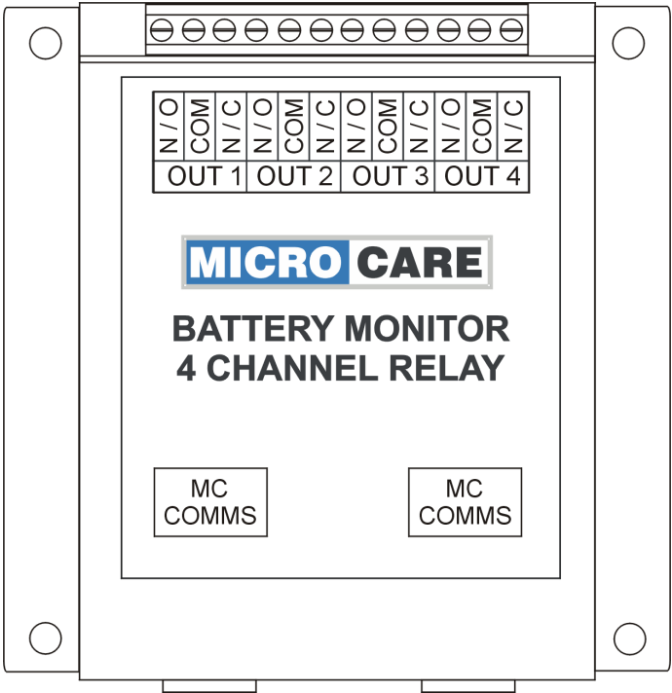
3.2 4 Channel Relay – Relay Outputs
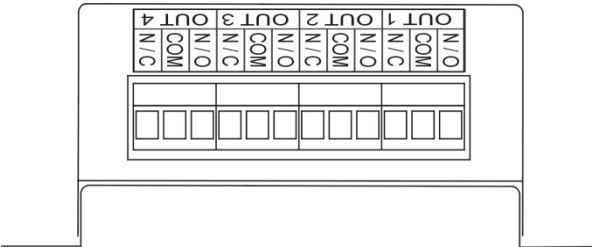
3.3 4 Channel Relay Comms Ports
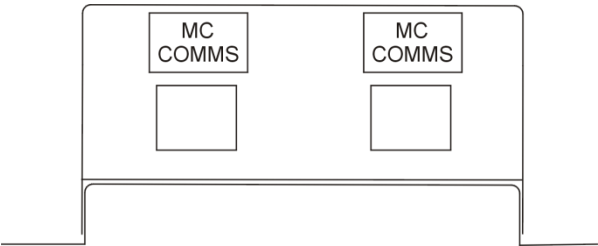
4. DIP SWITCH SETTINGS

Remove the top cover and set the DIP switch settings accordingly as per Fig: 4.
Replace the top cover and secure the screws.

In this position the relay outputs are assigned as Relay 1, 2, 3 and 4 as selected on the Battery Monitor

In this position the relay outputs are assigned as Relay 5, 6, 7 and 8 as selected on the Battery Monitor

Fig: 4

5.   GENERAL WIRING OPTIONS

6. PROGRAMMING THE RELAY OUTPUTS VIA THE BATTERY MONITOR

6.1 Setup – Output – Mode

How to enter the "Setup – Output1/Output 2 – Mode" menu:

This allows the user to set the mode in which the relay modules should function.

"FRC_ON" (Force On) – The relay will be on permanently.

"FRC_OFF" (Force Off) – The relay will be off permanently.

"SOC" (State of Charge) – The relay will be controlled by the state of charge (SOC) of the battery.
> For Example: When the battery only has 20% remaining, it may turn off.

"VOLT" (Voltage) - The relay will be controlled by the voltage of the battery.
> For Example: When the battery reaches 11 Volts, the relay will turn off.

"TOD" (Time of Day" – The relay will be controlled by the time of the day.
> For Example: The relay will turn on at 5 o'clock and turn off at 7 o'clock.

"TTG" (Time to Go) – The relay will be controlled by the time to go in the battery.

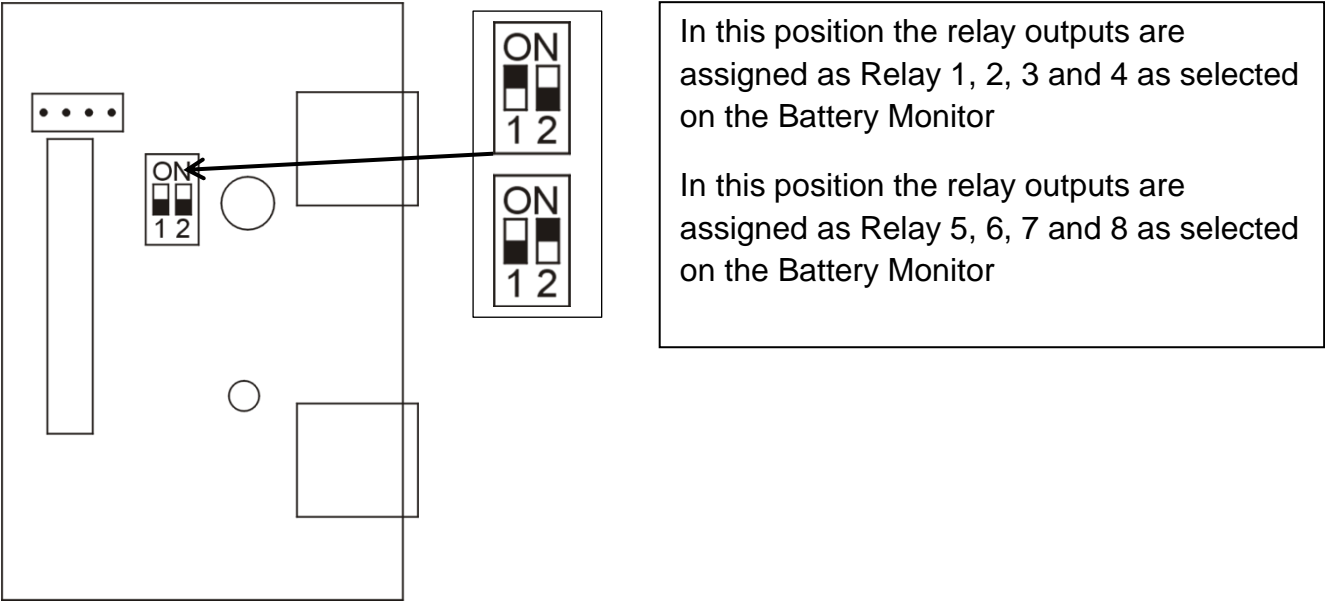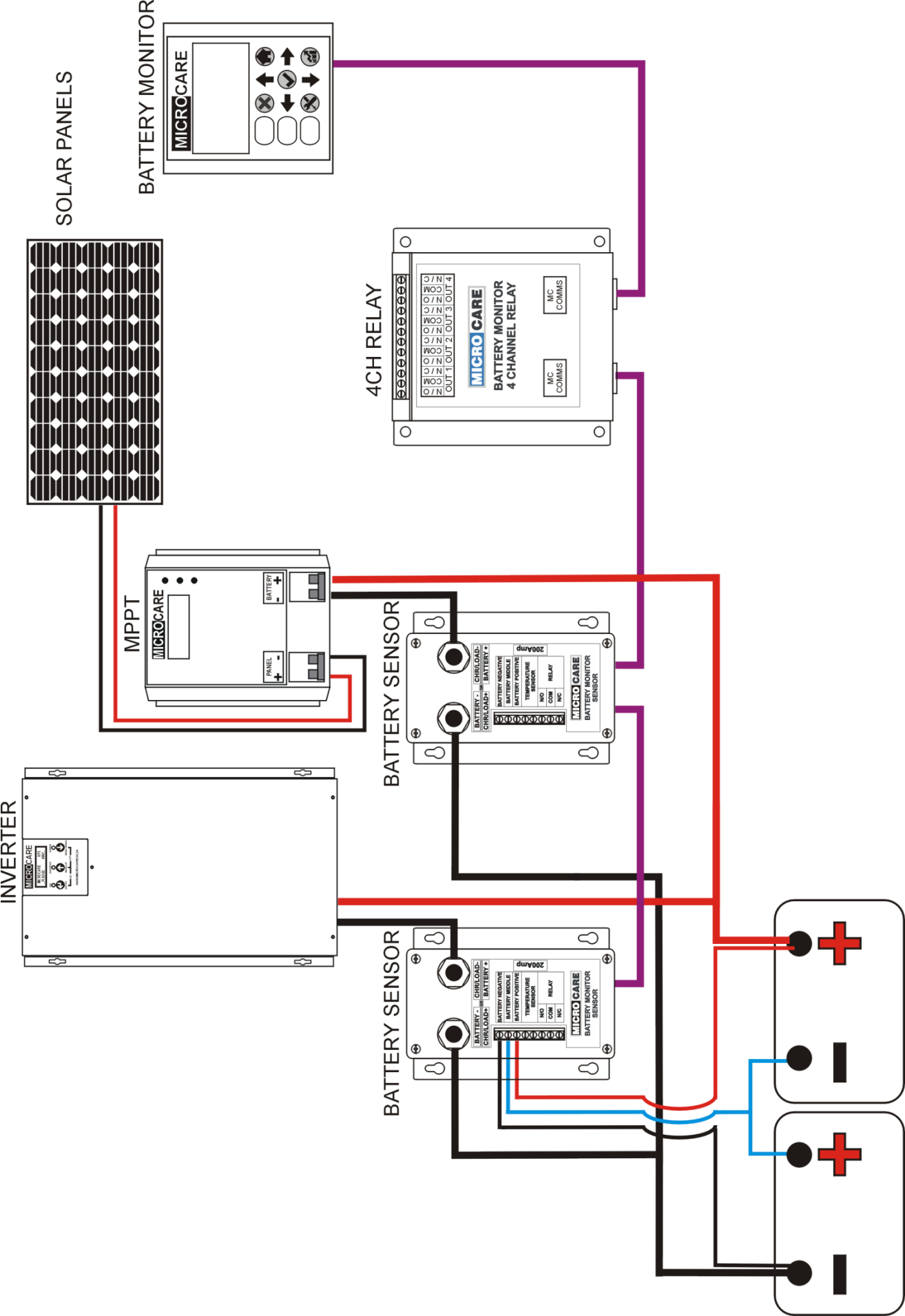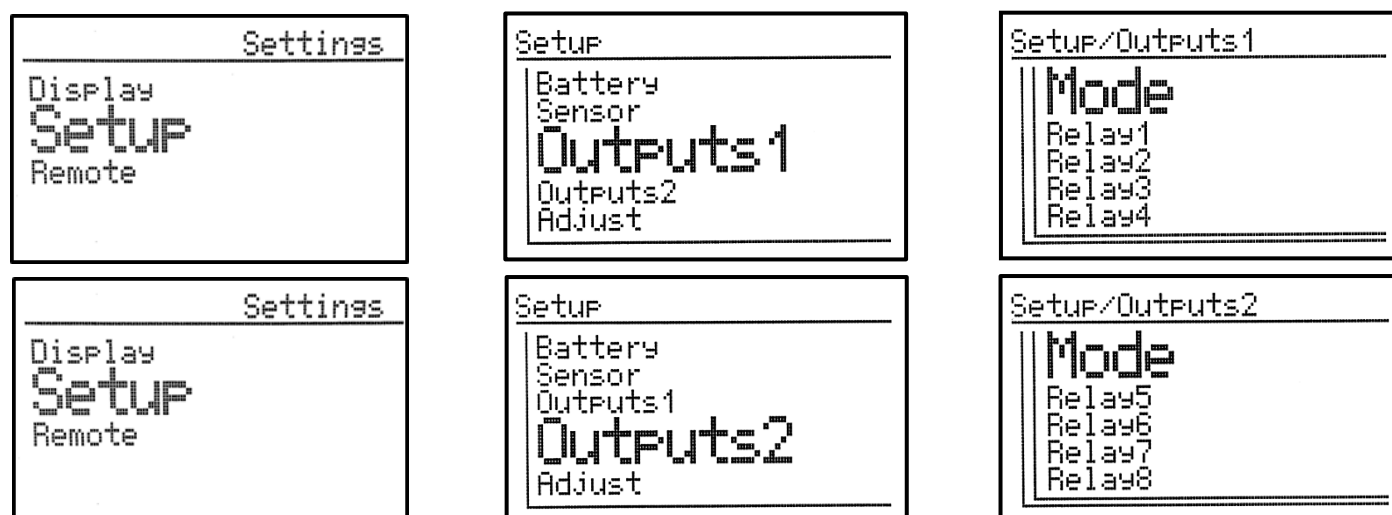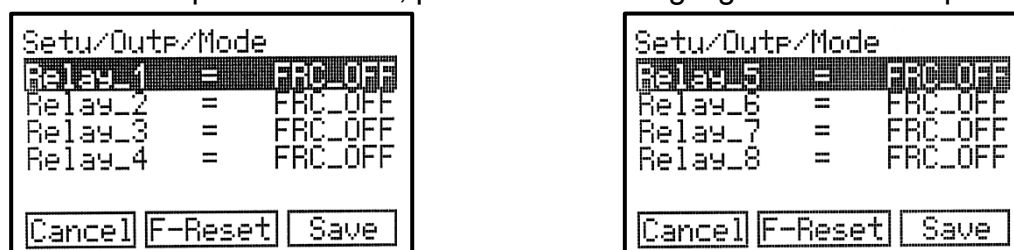> For Example: The relay will turn off if there is less than 8 hours of run time in the battery.

Settings	Setup	Setup/Outputs1
Display	Battery	Mode
Setup	Sensor	Relay1
Remote	**Outputs1**	Relay2
	Outputs2	Relay3
	Adjust	Relay4

Settings	Setup	Setup/Outputs2
Display	Battery	Mode
Setup	Sensor	Relay5
Remote	Outputs1	Relay6
	Outputs2	Relay7
	Adjust	Relay8

1. Press ✖ from the "Home" screen to enter the "Settings" screen.
2. In "Settings", press ⬆ or ⬇ to highlight "Setup" and press ✔.
3. In "Setup" sub-menu, press ⬆ or ⬇ to highlight the output menu you want, and press ✔.
   (Output 1 menu for relay 1 – 4 and Output 2 menu for relay 5 - 8)
4. In the "Output" sub-menu, press ⬆ or ⬇ to highlight "Mode" and press ✔.

Setu/Outp/Mode			Setu/Outp/Mode		
Relay_1	**=**	**FRC_OFF**	**Relay_5**	**=**	**FRC_OFF**
Relay_2	=	FRC_OFF	Relay_6	=	FRC_OFF
Relay_3	=	FRC_OFF	Relay_7	=	FRC_OFF
Relay_4	=	FRC_OFF	Relay_8	=	FRC_OFF
Cancel	F-Reset	Save	Cancel	F-Reset	Save

6.1.1 How to choose the mode of relay 1 - 8:

5. In "Setu/Outp/Mode", press ⬆ or ⬇ to highlight the relay you wish to change the mode of, and press ✔, then the option on the right will be highlighted.
6. Press ⬆ or ⬇ to choose the relay setting.
   Range: "SOC", "FRC_ON", "FRC_OFF", "TOD", "TTG" or "VOLT", "FRC_OFF = Default
7. Press ✔ on your desired selection.

<u>When desired changes have been made:</u>
8. <u>Save:</u>   Select "Save", then press ✔ to save changes made.
    <u>F-Reset:</u>   Select "F-Reset", then press ✔ to reset that battery monitor to its default.
    <u>Cancel:</u>   Select "Cancel", then press ✔ to cancel settings made.
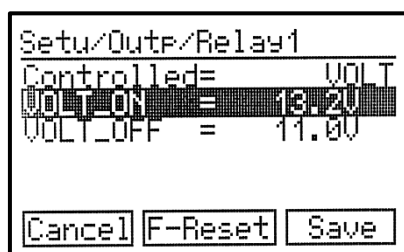
6.2   Setup – Output - Relay (If "VOLT" is selected)

<u>How to enter the "*Setup – Output - Relay" menu:*</u>

To allow the user to set the operation of the relay, according to the voltage of the battery.

A good recommendation for a non-essential load on a 12V battery would be "Volt_ON" = 13,8V and "Volt_OFF" = 11V. In this example, starting with a full battery the load will run until the battery falls below 11V, then the load will be turned off. The load will only turn back on when the battery recovers to above 13,8V.

1. Press ✖ from the "Home" screen to enter the "Settings" screen.
2. In "Settings", press ⬆ or ⬇ to highlight "Setup" and press ✔.
3. In "Setup" sub-menu, press ⬆ or ⬇ to highlight the output menu you want, and press ✔.
4. In the "Outputs" sub-menu, press ⬆ or ⬇ to highlight the "Relay" you want, and press ✔.

```
Setu/Outp/Relay1
Controlled=        VOLT
VOLT_ON    =      13.2V
VOLT_OFF   =      11.0V


[Cancel][F-Reset][Save]
```

<u>How to set the voltage at which the relay will turn on:</u>
5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "VOLT_ON" and press ✔, then the value in volts on the right will be highlighted.
6. Press ⬆ or ⬇ to choose the value in volts.
   Range: 48.0V = Minimum, 52.8V = Default, 58.0V = Maximum
7. Press ✔ on your desired selection.

<u>How to set the voltage at which the relay will turn off:</u>
5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "VOLT_OFF" and press ✔, then the value in volts on the right will be highlighted.
6. Press ⬆ or ⬇ to choose your value in volts.
   Range: 40V = Minimum, 44.0V = Default, 50V = Maximum
7. Press ✔ on your desired selection.

<u>When desired changes have been made:</u>
8. <u>Save:</u>   Select "Save", then press ✔ to save changes made.
    <u>F-Reset:</u>   Select "F-Reset", then press ✔ to reset that battery monitor to its default.
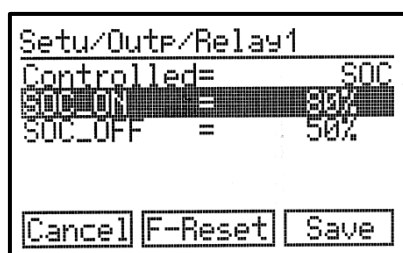   <u>Cancel:</u>   Select "Cancel", then press ✔ to cancel settings made.

6.3 Setup – Output – Relay (If "SOC" (State of Charge) is selected)

How to enter the "*Setup – Output - Relay" menu:*

To allow the user to set the operation of the relay, according to the state of charge (SOC) of the battery.

A good recommendation for a non-essential load would be "SOC_ON" = 90% and "SOC_OFF" = 40%. In this example, starting with a full battery the load will run until the battery falls below a 40% SOC, then the load will be turned off. The load will only turn back on when the battery recovers to above a 90% SOC.

1. Press ✗ from the "Home" screen to enter the "Settings" screen.
2. In "Settings", press ⬆ or ⬇ to highlight "Setup" and press ✔.
3. In "Setup" sub-menu, press ⬆ or ⬇ to highlight the output menu you want, and press ✔.
4. In the "Output" sub-menu, press ⬆ or ⬇ to highlight the relay you want, and press ✔.

```
Setu/Outp/Relay1
Controlled=      SOC
SOC_ON   =       80%
SOC_OFF  =       50%


Cancel  F-Reset   Save
```

How to set the SOC at which the relay will turn on:

5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "SOC_ON" and press ✔, then the value in percentage on the right will be highlighted.
6. Press ⬆ or ⬇ to choose the value in percentage.
   Range: 50% = Minimum, 80% = Default, 100% = Maximum
7. Press ✔ on your desired selection.

How to set the SOC at which the relay will turn off:

5. In "Setu/Outp/Relay" press ⬆ or ⬇ to highlight "SOC_OFF" and press ✔, then the value in percentage on the right will be highlighted.
6. Press ⬆ or ⬇ to choose the value in percentage.
   Range: 0% = Minimum, 50% = Default, 80% = Maximum
7. Press ✔ on your desired selection.

When desired changes have been made:

8. Save: Select "Save", then press ✔ to save changes made.
   F-Reset: Select "F-Reset", then press ✔ to reset that battery monitor to its default.
   Cancel: Select "Cancel", then press ✔ to cancel settings made.

6.4   Setup – Output – Relay (If "TOD" (Time of Day) is selected)

<u>How to enter "Setup – Output – Relay":</u>

To allow the user to set the operation of the relay according to the time of day.

A good recommendation for a timed load would be "Hour_ON" = 18, "Min_ON" = 30, "Hour_OFF" = 7, "Min_OFF" = 20. In this example the load will turn on at 18:30 (6:30pm) at night and only turn back off at 7:20 (7:20am) in the morning.

1. Press ✖ from the "Home" screen to enter the "Settings" screen.
2. In "Settings", press ⬆ or ⬇ to highlight "Setup" and press ✔.
3. In "Setup" sub-menu, press ⬆ or ⬇ to highlight the output menu you want, and press ✔.
4. In the "Outputs" sub-menu, press ⬆ or ⬇ to highlight the relay you want, and press ✔.

```
Setu/Outp/Relay1
Controlled=        TOD
Hour_ON    =        18
Min_ON     =         0
Hour_OFF   =         7
Min_OFF    =         0
Cancel  F-Reset  Save
```

<u>How to set the hour to turn on:</u>
5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "Hour_ON" and press ✔, then the value in hours on the right will be highlighted.
6. Press ⬆ or ⬇ to enter the value in hours.
   Range: 0 = Minimum, 18 = Default, 23 = Maximum
7. Press ✔ on your desired selection.

<u>How to set the minute to turn on:</u>
5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "Min_ON" and press ✔, then the value in minutes on the right will be highlighted.
6. Press ⬆ or ⬇ buttons to enter the value in minutes.
   Range: 0 = Minimum, 0 = Default, 59 = Maximum
7. Press ✔ on your desired selection.

<u>How to set the hour to turn off:</u>
5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "Hour_OFF" and press ✔, then the value in hours on the right will be highlighted.
6. Press ⬆ or ⬇ to enter the value in hours.
   Range: 0 = Minimum, 7 = Default, 23 = Maximum
7. Press ✔ on your desired selection.

<u>How to set the minute to off:</u>
5. In "Setu/Outp/Relay", press ⬆ or ⬇ to highlight "Min_OFF" and press ✔, then the value in minutes on the right will be highlighted.
6. Press ⬆ or ⬇ to enter the value in minutes.
   Range: 0 = Minimum, 0 = Default, 59 = Maximum
7. Press ✔ on your desired selection.

<u>When desired changes have been made:</u>
9. <u>Save:</u>   Select "Save", then press ✔ to save changes made.
   <u>F-Reset:</u>   Select "F-Reset", then press ✔ to reset that battery monitor to its default.
   <u>Cancel:</u>   Select "Cancel", then press ✔ to cancel settings made.
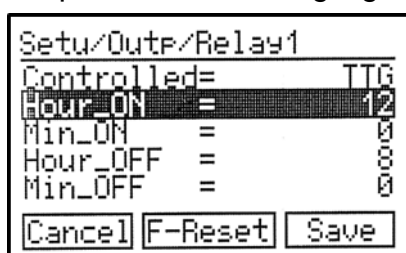
6.5 Setup – Output – Relay (If "TTG" (Time to Go) is selected)

How to enter "Setup – Output – Relay":

To allow the user to set the operation of the relay according to the usable time remaining in the battery.

A good recommendation for a non-essential load would be "Hour_ON" = 24, "Min_ON" = 15, "Hour_OFF" = 8, "Min_OFF" = 0. In this example, starting with a full battery the load will run until there is less than 8 hours of operation remaining in the battery, the load will then be turned off. The load will only turn back on when the battery recovers to having more than 24hours and 15minutes of operation remaining in it.

1. Press ✗ from the "Home" screen to enter the "Settings" screen.
2. In "Settings", press ↑ or ↓ to highlight "Setup" and press ✔.
3. In "Setup" sub-menu, press ↑ or ↓ to highlight the output menu you want, and press ✔.
4. In the "Output" sub-menu, press ↑ or ↓ to highlight the relay you want, and press ✔.

```
Setu/Outp/Relay1
Controlled=        TTG
Hour_ON    =        12
Min_ON     =         0
Hour_OFF   =         8
Min_OFF    =         0
Cancel F-Reset  Save
```

How to set the hour on:
5. In "Setu/Outp/Relay", press ↑ or ↓ to highlight "Hour_ON" and press ✔, then the value in hours on the right will be highlighted.
6. Press ↑ or ↓ to enter the value in hours.
   Range: 0 = Minimum, 12 = Default, 23 = Maximum
7. Press ✔ on your desired selection.

How to set the minute on:
5. In "Setu/Outp/Relay", press ↑ or ↓ to highlight "Min_ON" and press ✔, then the value in minutes on the right will be highlighted.
6. Press ↑ or ↓ to enter the value in minutes.
   Range: 0 = Minimum, 0 = Default, 59 = Maximum
7. Press ✔ on your desired selection.

How to set the hour off:
5. In "Setu/Outp/Relay", press ↑ or ↓ to highlight "Hour_OFF" and press ✔, then the value in hours on the right will be highlighted.
6. Press ↑ or ↓ to enter the value in hours.
   Range: 0 = Minimum, 8 = Default, 23 = Maximum
7. Press ✔ on your desired selection.

How to set the minute off:
5. In "Setu/Outp/Relay", press ↑ or ↓ to highlight "Min_OFF" and press ✔, then the value in minutes on the right will be highlighted.
6. Press ↑ or ↓ to enter the value in minutes.
   Range: 0 = Minimum, 0 = Default, 59 = Maximum
7. Press ✔ on your desired selection.

When desired changes have been made:
8. Save: Select "Save", then press ✔ to save changes made.
   F-Reset: Select "F-Reset", then press ✔ to reset that battery monitor to its factory default settings.
   Cancel: Select "Cancel", then press ✔ to cancel settings made

7.   4 CHANNEL RELAY SPECIFICATIONS

Model	4 Channel Relay
Communication	RS485
Communication Cable	CAT5 , 4 pair Cable with RJ45 , 8P8C connectors
Relay Outputs	4 x Relays N/O, COM and N/C
Relay Contact Ratings	10A @ 250VAC
Dimensions (H x W x D)	110 x 109 x 45mm
Warranty	1 year

8. DESTRIER ELECTRONICS LIMITED CARRY- IN WARRANTY

Destrier Electronics warrants the 4 Channel Relay against defects in workmanship and materials, fair wear and tear accepted, for a period of 1 (one) year from the date of delivery/collection for all equipment and is based on a carry-in basis. Where the installation of the product makes it impractical to carry-in to our workshops, Destrier Electronics reserves the right to charge for travel time and kilometres travelled to and from the site where the product is installed.

During this warranty period, Destrier Electronics will, at its own discretion, repair or replace the defective product free of charge. This warranty will be considered void if the unit has suffered any physical damage or alteration, either internally or externally, and does not cover damages arising from improper use such as, but not exclusive to:
- Reverse of battery polarity.
- Inadequate or incorrect connection of the product and/or of its accessories.
- Mechanical shock or deformation.
- Contact with liquid or oxidation by condensation.
- Use in an inappropriate environment (dust, corrosive vapour, humidity, high temperature, biological infestation.)
- Breakage or damage due to lightning, surges, spikes or other electrical events.
- Connection terminals and screws destroyed or other damage such as overheating due to insufficient tightening of terminals.
- When considering any electronic breakage except due to lightning, reverse polarity, over-voltage, etc. the state of the internal control circuitry determines the warranty.

This warranty will not apply where the product has been misused, neglected, improperly installed, or repaired by anyone else than Destrier Electronics or one of its authorised Qualified Service Partners. In order to qualify for the warranty, the product must not be disassembled or modified. Repair or replacements are our sole remedies. Destrier Electronics shall not be liable for damages, whether direct, incidental, special, or consequential, even caused by negligence or fault. Destrier Electronics owns all parts removed from repaired products. Destrier Electronics uses new or re-conditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Destrier Electronics repairs or replaces a part of a product, its warranty term is not extended. Removal of serial nos. may void the warranty.

All remedies and the measure for damages are limited to the above. Destrier Electronics shall in no event be liable for consequential, incidental, contingent or special damages, even if having been advised of the probability of such damages. Any and all other warranties expressed or implied arising by law, course of dealing, course of performance, usage of trade or otherwise, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited in duration to a period of 1 (one) year from the date of purchase.

Life Support Policy:
As a general policy, Destrier Electronics does not recommend the use of any of its products in life support applications where failure or malfunction of the Destrier Electronics product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness.

Destrier Electronics does not recommend the use of any of its products in direct patient care. Destrier Electronics will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to Destrier Electronics that the risks of injury or damage have been minimised, the customer assumes all such risks, and the Liability of Destrier Electronics is adequately protected under the circumstances.

Caution:
Our products are sensitive. While all care is taken by us to dispatch goods with adequate packaging, Destrier Electronics is not responsible for any damages caused to products after they have left our premises.

9.   REGISTRATION OF MY MICROCARE PRODUCT

Product Serial Number: _____

Product Description: _____

Date Purchased _____

Where was the Product Purchased?

Company Name _____

Contact Person _____

Contact Number _____

E-mail Address _____

Installation Company Information:

Company Name _____

Contact Person _____

Contact Number _____

E-mail Address _____

Details of Product Owner

Name & Surname _____

Address _____

City & Province _____

Contact Number _____

E-mail Address _____

Date Installed _____

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Online Registration: www.microcare.co.za/register-my-product