victron energy
BLUE POWER

Manual EN

1   Introduction

1.1   Introduction to Victron Energy

Victron Energy has established an international reputation as a leading designer and manufacturer of energy systems. Our R&D department is the driving force behind this reputation. It is continually seeking new ways of incorporating the latest technology in our products. Each step forward results in value-added technical and economical features.

Figure 1 - The exterior of the Victron Global Remote IO Extender

1.2   The VGR IO Extender

The VGR IO extender expands the capabilities of the Victron Global Remote *(referenced as* VGR *hereafter)* by extending the power supply range, adding a temperature sensor, providing general purpose inputs for switched sensors and relay outputs. The status of the inputs and outputs can be monitored using SMS commands, as well as through automatic alerts when inputs change. When an Internet connection is available, input and output status of the IO Extender may be logged to the Victron Remote Management web site, where the data can be viewed as a graph plotted over time.

Note : SMS stands for *'Short Message Service'*, a service enabling mobile phones to send text messages.

victron energy   **1**

2   Hardware installation

2.1   Package contents

The package in which the VGR IO Extender is delivered should contain
the following items:

A)   1 x   VGR IO Extender
              (a small plastic box housing the extender electronics and terminations)
B)   1 x   Power cable
              (with a 4-pin connector on one end and a 6-pin connector on the other)
C)   1 x   Temperature sensor
   *(a two-wire cable with a ring terminal housing the temperature sensor)*

Figure 2 -
The contents of the
IO Extender package.

2.2   Installation instructions

1) Connect the 12-pin connector on the VGR **Y**-cable to the VGR header
   on (A). The connector is keyed to ensure the correct orientation.

2) Connect the 6-pin connector of cable (B) to the 'Power Out' socket on (A).

3) Remove the 4-pin connector from the power socket of the Global Remote.

4) Connect the 4-pin connector of cable (B) to the power socket on the VGR.

5) Connect both black (GND) and red (+) wires of (C) to the temperature
   sensor input on (A) and connect the ring terminal (the sensor housing)
   to the negative pole of the battery (mechanical coupling).

6) Connect the inputs and outputs to the required devices.

7) Connect the 4-pin power connector (previously powering the VGR)
   supplied with the VGR to the 'Power In' socket on (A).

victron energy

Figure 3 - The housing of the VGR IO Extender and its connections.

Power in

VGR

TEMP IN3 IN2 IN1 OUT2 OUT1
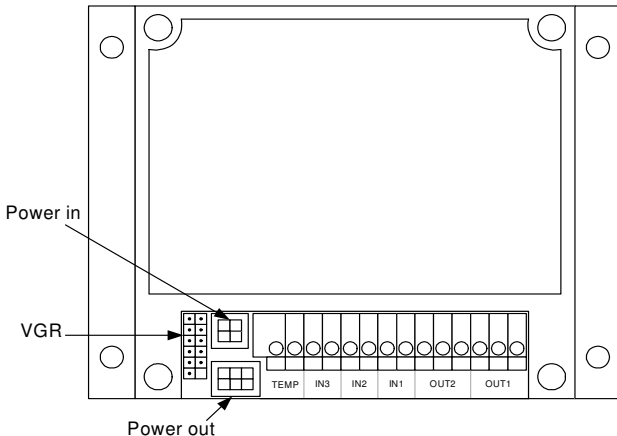
Power out

_____ **W A R N I N G** _____

The VGR IO Extender is designed for supply voltages ranging from 8 to 70 VDC,
but the power supply of the Victron Global Remote is limited to 32 VDC max.
The 'Power Out' feature of the VGR IO Extender will regulate the voltage not to
exceed 32VDC making the 'Power Out' voltage suitable for feeding the VGR.

Care must be taken not to connect the Victron Global Remote
directly to a voltage greater than 32 VDC.

3   Using the VGR IO Extender

The VGR IO Expander is controlled through the use of SMS commands.
To set the state of an output, the following command structure is used:

```
output <output number> <output state>
```

can be either *1* or *2*.

can be either *on*, *off*, *open*, or *closed*.

. commands	output contacts	
	N.O.	N.C.
On	closed	open
off	open	closed
closed	closed	open
open	open	closed

To configure alarm level of the inputs, the following structure is used:

```
input <input number> alarm <alarm trigger>
```

<input number> can be either *1*, *2*, or *3*.
<alarm trigger> can be either *open*, *closed*, or *none*.

When a condition changes, initiating an alarm, an SMS message will be sent immediately. This message will be sent to the telephone number configured in the Victron Global Remote using the *alert* command. *(see the User Manual supplied with your VGR for more information on this and other SMS commands)*

The current state of all inputs and outputs can be requested with the following command:

```
io
```

Sending any of the above commands to your Global Remote while the VGR IO Extender is not connected yet, will have the Global Remote return a 'not connected' message to the phone you used to send the SMS.

victron energy

3.1   Examples

To switch on output 2, send the command:

```
output 2 on
```

or

```
output 2 closed
```

To set input 3 to generate alarms when the switch is open,
send the following command:

```
input 3 alarm open
```

To set input 3 not to generate any alarms, send the command:

```
input 3 alarm none
```

For more information about the SMS system and a full description of the VGR,
see the User Manual that was supplied with your Victron Global Remote.
You should have your VGR installed and tested properly before adding the
VGR IO Extender to your installation in order to be able to install the Extender.

4   Specifications

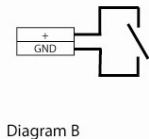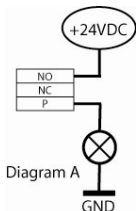| VGR IO Extender		
Power supply voltage range	VDC	8 ... 70
Power Out voltage range	VDC	8 ... 32
Current draw	(max)	100mA @ 12VDC
Operating temperature range	°C	-30 ... +75
Inputs & outputs		
One (1) analog input - suitable for the supplied temperature sensor		
Three (3) digital inputs – suitable for potential-free contacts only		
Two (2) digital outputs – each offering a single toggle relay contact		
Enclosure		
Dimensions	mm	115.5 x 90 x 40.5
Weight	kg	0.140

victron energy

5   Frequently Asked Questions (FAQ)

Q   I don't know how to send SMS messages.

A   *Please refer to the user manual that was supplied with your VGR.*
The user manual of your cell phone may be helpfull as well.

Q   The IO status message does not list a temperature. What is wrong here?

A   *The temperature sensor is either not connected correctly or is broken.*
Please check both the temperature sensor and its cable connections.

Q   Output contacts act opposite to the commands I sent. What is wrong?

A   *You may have used the NC (normally closed) contact instead of the NO*
(normally open) contact. See the wiring examples on the inner back cover.

Q   My VGR tells me that the IO Extender is not connected. It is connected!

A   *You may have connected the temperature sensor wires incorrectly.*
Red should be connected to + and black should be connected to GND.

6   Examples

Diagram A is a sample circuit
for switching loads using the
outputs of the VGR IO Extender.

The lamp in this example can be switched on by sending:
> **"output <output number> on"**

Once it is switched on, it may be switched off by sending:
> **"output <output number> off"**

Diagram B is a sample circuit for potential free contacts to issue alarms using
the VGR IO Extender's inputs.

The potential-free switch contact in diagram B is a normally open type, which
means that you would want to detect when its contact closes. This may be a
contact that closes when the lubricating oil in your engine gets overheated
or one that closes when the level of water in your boat reaches a critical level.

To have this *(normally open)* switch initiate an alarm being sent to your cell
phone when its state changes *(closes)*, send **"input 3 alarm closed"**
to your Global Remote *(assuming the contact is connected to input 3).*

You may disable this alarm function of input 3 by sending
> **"input 3 alarm none"**

——————— PLEASE NOTE ———————

for instructions on how to adapt your Global Remote installation
to add the VGR IO Extender, please see the colour installation diagram
supplied with this manual (size A4).

victron energy

Victron Energy Blue Power

Distributor:

Serial number:

Version   :   0
Date   :   25 January 2010