

Depending on the mass-storage options installed (Compact Flash card and/or 2.5" hard disk drive) the power consumption is in the range 2.5 to 4.0 watts. The USB port may power external USB devices drawing up to 0.5A at +5V resulting in a further 2.5 watts of power consumption.

A standard VR1000 as shipped from the factory with 512MB Compact Flash card consumes 170mA at 13.5 volts resulting in a power consumption of 2.3 watts. When the VR1000 is off (in standby mode) it draws under 1mA from the primary supply.

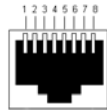
GPS antenna

The VR1000 uses an external GPS antenna for vehicle location and tracking applications. The antenna must be a 26dB active type and operate from 4.5V DC supplied on the centre pin of the GPS antenna connector. The antenna connector is a standard 50 ohm SMB RF connector.

The antenna should be mounted horizontally on a high point on the vehicle (e.g. the roof) with an uninterrupted view of the sky. Refer to the GPS antenna manufacturer's installation instructions for further advice.

Serial port connections

The VR1000 has four RS232 serial ports provided on RJ45 connectors for use with external data devices. The pin outs are as follows:



Pin	Name	Direction	Description
1	RTS	Output	Ready To Send (flow control)
2	DTR	Output	Data Terminal Ready (general purpose)
3	TXD	Output	Transmit Data
4	GND	-	Ground
5	GND	-	Ground
6	RXD	Input	Receive Data
7	DCD	Input	Data Carrier Detect (general purpose)
8	CTS	Input	Clear To Send (flow control)

WARNING: Do not 'over-drive' the outputs by connecting them to a power source as this can damage the RS232 driver chips

Ethernet port connections

The VR1000 has two 10/100Mbps Ethernet ports. Use shielded (STP) cable with metalised RJ45 connectors to ensure a good earth contact and conform to EMC requirements.

USB ports

The two USB ports use standard USB 1.1 connections with a Type-A connector. Use screened USB cables to connect USB devices.

VR1000 Vehicle Router Installation Guide



Introduction

The VR1000 is an in-vehicle computing device designed to operate from a nominal 12V negative earth supply, not from the vehicle's main engine battery. Instead, the unit should be powered from the "communications" or "technical" power supply (refer to diagram on page 3).

This installation guide provides basic information and is not intended to be definitive. The equipment must be installed in accordance with the requirements of the local Health and Safety regulations. Please refer to the VR1000 manual for further information.

The installer must ensure that an appropriate mounting location is chosen, that the correct fixing screws are used, and that the installation is safe. The VR1000 should be positioned so that it does not obstruct any occupant, or other devices, nor interfere with existing vehicle safety systems.

All cables (power, serial, Ethernet and GPS antenna) must be routed as far away as possible from fuel lines and existing vehicle wiring. All cabling should be secured and hidden under carpets, trim or trunking, and not left loose where it might pose a hazard.

Thorcom Systems Limited
Unit 4, 96B Blackpole Trading Estate West
Worcester
WR3 8TJ
England, U. K.
Web: www.thorcom.co.uk Email: support@thorcom.co.uk

Document Number 100-00324

Revision 1.00

WARNINGS and PRECAUTIONS

- The VR1000 must not be connected directly to the main engine battery of the vehicle
- All cables must not exceed a maximum of 3.0m in length
- Power connections must be fused at 2A (both leads)
- Cables connected to the Ethernet LAN ports must be shielded twisted pair types, using high quality screened RJ45 connectors
- No part of the equipment should be mounted such that injury to the occupants is likely during an accident
- All four mounting points must be used, with appropriate fixings at the correct length
- Ensure that fuel lines, hydraulic lines and existing cables are not damaged during installation
- Ensure that the installation does not interfere with the normal operation of the vehicle, including the operation of safety devices such as airbags, seat-belt tensioners, etc.

VR1000 Installation

Temperature — the VR1000 should not be exposed to wide temperature variations. Exposure to direct sunlight may cause the temperature to rise above 60 degrees C. Prolonged exposure to very high temperatures may damage the equipment and invalidate the warranty.

Orientation — the VR1000 can be installed in any orientation and position in the vehicle that is convenient and safe.

Mounting – Suitable locations include: under a passenger seat, in the boot/trunk, or in vans/lorries bolted to the internal bulkhead between the passenger compartment and the load carrying area. The VR1000 is not waterproof, choose a location where the unit cannot come into contact with water, rain, or other forms of moisture. Ensure sufficient space is provided to allow cables to be fitted and removed, and access for removal or replacement of the device if maintenance is required.

Fixings — The VR1000 enclosure incorporates four oval hole fixing points in the bracket feet on 140 mm x 186 mm centres for use with M3.5 pan-head self-tap screws or similar fixings. Ensure the fixing is secure, but will not damage anything located behind the fixing point.

Power and digital I/O connector

The power and digital input/output connector is a 12-way Molex Mini-Fit Junior 0.093" family (Molex part number 39-29-1128) with the following pin-out:

12	11	10	9	8	7
6	5	4	3	2	1

View looking in from outside VR1000

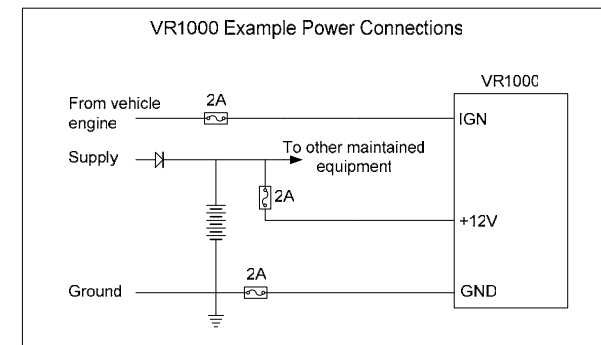
Pin	Name	Description	Colour	Rating (A)
1	GND	Ground	Black	3
2	PWR	Nominal +12V DC power input (unswitched)	Red	3
3	IGN	Ignition Sense – input	Yellow	3
4	ALM	Alarm Sense – input		
5	IN1	General purpose input #1	Blue	3
6	IN2	General purpose input #2		
7	RLNC	Output #1 – Relay contact (Normally closed)	Green	6
8	RLCM	Output #1 – Relay contact (Common)	Red	6
9	RLNO	Output #1 – Relay contact (Normally open)		
10	OUT2	Output #2 – Open collector		
11	IN3	General purpose input #3		
12	IN4	General purpose input #4		

Standard power lead

Thorcom provides a standard power lead (part number 70-00206) with the VR1000. The lead is supplied partially assembled with pins 1, 2 and 3 installed in the connector housing and the other wires bundled but not loaded – if these are not required they can be discarded.

Power supply wiring

The VR1000 should be connected to the “technical battery” or “communications battery” as shown in the diagram. Note that the positive and negative leads should be connected to the battery and fused locally at the battery with a 2A automotive style blade fuse in both the positive and negative leads to protect the wiring against faults. The ignition sense wire, if used, should also be protected with a 2A fuse connected at the source of the ignition sense signal.



Power supply requirements

The VR1000 operates from a nominal 12V negative earth supply – voltage range 10.0 to 18.0 volts for normal operation. In practice the VR1000 will operate over a wider supply range but this is not recommended and should not be relied upon.