white bream

Automotive USB hub

White Bream Oud-Beijerland The Netherlands www.whitebream.com			
Description:	User manual		P523RP100 Manual.odt
Project:	P523		*P523RP100*
Status:	Draft	Pages: 20	

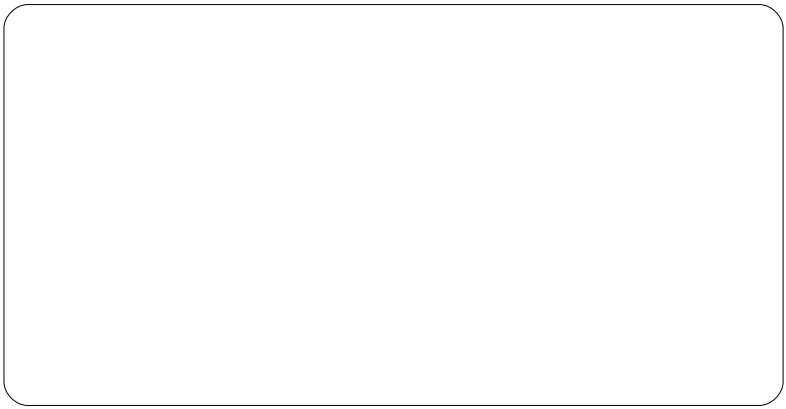


Table of Contents

blank page

1 Preface

1.1 Disclaimer

White Bream products are not authorized for use in, or in connection with surgical implants, or as critical components in any medical or nuclear, or aircraft, or other transportation devices or systems where failure to perform can reasonably be expected to cause significant injury to the user, without the express written approval of an executive officer of White Bream. Such use is at buyer's sole risk, and buyer is responsible for verification and validation of the suitability of products incorporated in any such devices or systems. Buyer agrees that White Bream is not liable, in whole or in part, for any claim or damage arising from such use and shall have no obligation to warranty such products. Buyer agrees to indemnify, defend and hold White Bream harmless from and against any and all claims, damages losses, costs, expenses and liabilities arising out of or in connection with buyer's use of White Bream products in such applications to the extent buyer has not obtained the express written approval of an executive officer of White Bream.

1.2 Trademarks

Throughout this manual, the trade names and trademarks of various companies and products may have been used, and no such uses are intended to convey endorsement of or other affiliations with this manual or product. Any brand names or product names used within this manual are trademarks or registered trademarks of their respective holders.

1.3 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

1.4 Liability

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

1.5 Technical support

White Bream technicians and engineers are committed to providing the best possible technical support for our customers so that our products can be easily used and implemented. We request that you first visit our website at www.whitebream.com for the latest documentation, utilities and drivers, which have been made available to assist you. If you still require assistance after visiting our website then contact our technical support department by email at support@whitebream.com.

Warning

Warning messages in the manual may contain important information against product malfunction or safety information for the (end-)user.

Caution

Notices regarding proper use of the product and to warn the user about how to prevent damage to hardware or loss of data.

Information

Tips, tricks and suggestions regarding the use or installation of the product.

Antistatic Precautions

The internals of the product are made of static sensitive components. When disassembling the product, it is strongly recommended to use an antistatic benchmat and wriststrap. If this is not possible, at least make sure you always touch an exposed metal part, such as the shield of an USB connector, each time before you touch anything else inside.

ROHS - WEEE

White Bream products are manufactured using lead-free components and assembly processes. Please dispose of products according local waste regulations.

2 Introduction

This self powered 4-port USB hub has a power supply that is suitable for 12V and 24V automotive use. To conserve battery power this power supply is disabled when the USB hub is suspended by the host. High retention USB sockets reduce the chance of plugs being pulled or vibrating loose. The housing has flanges to accomodate easy fixed install in vehicles or industrial systems.

The USB hub provides an auxilliary power ouput that is switched simultaneously with the suspend function of the hub. This allows for powering power-hungry devices when the PC system is on.

Additionally, the hub has a force-on input that forces the powersupply and the auxilliary output to stay active after the hub is has been suspended. This allows other devices to keep power active until they have completed shutdown procedure for example.

2.1 Specifications

- 4-port USB2.0
- 480mbps, multiple TT
- Downstream high retention USB sockets
- Upstream non-detachable USB A cable 50cm
- DC power input 6-36VDC ISO7637
- Power supply 5V 2A, efficiency 85-90%
- 7uA(typ), 20uA(max) current from battery during suspend
- 0.9mA(typ), 2.1mA(max) idle current
- Auxilliary power output
- Force-on control input
- Power and auxilliary on 4-way 3.5mm detachable screw terminals
- Dimensions 85x57x27mm, flange area 110x57mm

blank page

3 Connections and controls

Core function of the module is the USB HUB controller. This controller arranges for the connection of up to four high- speed USB 2.0 downstream devices to an USB host port. It implements multiple transaction translator (TT) architecture that provide dedicated TT to each downstream port, which guarantee full-speed data passing bandwidth when multiple full-speed devices perform heavy loading operations.

3.1 Suspend

One of the features of USB which is an essential part of today's emphasis of 'green' products is its ability to power down an unused device. It does this by suspending the device, which is achieved by not sending anything to the device for 3 ms.

When the HUB controller detects this suspend mode, it will switch off the LED indicator and turn off the enable signal to the power supply regulator.

3.2 Suspend Override

If an attached device requires more power during suspend, then the internal power supply can be kept active. This is done by feeding a non-zero voltage into the OVR input. OVR does not activate the power supply once it has been turned off.

3.3 Auxilliary Out

Devices that need more than the standard USB power (5V / 500mA) can use the AUX power output. This output is active when the internal 5V power supply is active, hence also when suspend override in engaged. Use this ouput to power devices that need external power to operate, but use too much idle current to leave attached permanently.

blank page

4 Specifications

4.1 Electrical

Parameter	Min	Typ	Max	Unit
Vbattery	6		33	VDC
Vbattery (loaddump surge)			60	VDC
Internal 5V regulator current			2	A
Quesient current		0.9	2.1	mA
Suspend current		7	20	µA
Aux output, current		1.8	2.2	A
Force on input voltage	2		60	V
Force on impedance		50		kΩ

4.2 Environmental

Parameter	Min	Max	Unit
Operating temperature range	0	+70	°C
Non-operating temperature range	-40	+100	°C
Humidity (non condensing)	5	95	%

4.3 Compliance

Please refer to annex C

blank page

5 Installation

This USB HUB module is intended for fixed installation. Although the power wire connections have screw retainers, these are not suitable for working with floating or moving wire assemblies!

5.1 Power

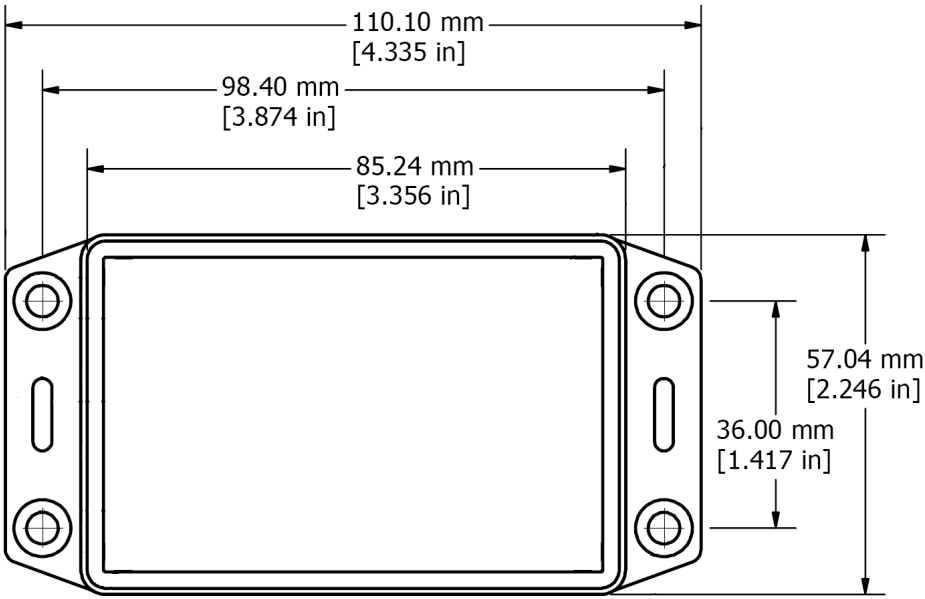
Connections to the power source must be made using wire gauge no less than 0.5qmm (~AWG #20). These should not be longer than 1.8m (6ft). We recommend to connect GND to the nearest available grounding point in the vehicle or system. The power connection should connect to a permanent 12V/24V supply.

<diagram>

If this supply is capably of more than 10 Amps of current, then this source must be fused with a 10A automotive fuse (ATO or similar). This protects the wiring in case of short-circuit situations. Otherwise, prolonged excessive current through the wires could result in overheating or fire.

Wires must be stripped over 5-6mm. Too much will expose the copper and too less will not allow for secure fastening. Always ensure that the wires are installed cleanly and fully into the terminal pockets. No protrusing wire strands are allowed at any time. If the wire is to be reinstalled, we highly recommend to cut the old exposed end and strip a new end.

5.2 Dimensions



- Slotted holes (2x) 2.7 x 11.1mm
- Round holes (4x) 4.6mm countersunk

6 Drivers

All reasonably recent operating systems come with the USB HUB class drivers pre-installed. No additional driver installation is required.

blank page

Annex A: Certifications

A.1 CE Declaration of Conformity

We, White Bream, hereby certify that the CARGO/UNIGO computer system complies with the CE requirements as laid out in directive 2004/108/EC

A.2 Automotive

The CARGO/UNIGO computer system has passed precompliance testing for automotive emissions and immunity according the requirements laid out in the automotive directive 2004/104/EC.

A.3 FCC Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

Consult the dealer or an experienced radio/TV technician for help

A.4 Underwriter Laboratories

Our products are designed to be compliant with UL requirements for product safety. However, no testing or validation has been done to access this compliance.

A.5 ROHS

White Bream products are created using lead-free components and assembled accordingly.

blank page

Version	Date	Comment Copyright © White Bream, 2014
1.0	Feb 5, 2014	Initial document

Terborchdreef 26, 3262NB
Oud-Beijerland, The Netherlands

Email: info@whitebream.nl
Development: www.whitebream.nl
Electronics: www.whitebream.com