white bream

UNIGO

System manual

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1   Preface

1.1   Drivers responsibility

This system is intended to provide logistic data management or in-car entertainment facilities. Drivers must be aware that operating either use while participating in traffic is not recommended and can even be dangerous when this involves complex tasks like browsing for addresses. Also note that many countries prohibit the display of motion picture in sight of the driver when the car is moving.

1.2   Legal issues

Some countries have laws regarding the use of computers and computer-like equipment within the drivers reach or sight. Aside from those countries, just about every country has laws regarding endangering traffic regardless the cause. This means that even if there is no specific law in your country, you may still get ticketed when operating the computer while driving.

1.3   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.

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1.4   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.

1.5   Liablility

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.

2   Connections and controls

2.1   Front panel connections and controls

1) Power button. A normal press issues a start or shutdown of the system. Holding the button for about 4 seconds will cut power instantly (not recommended during normal use).
Holding the button for ~30 seconds will reset the system controller.
2) Reset button.
3) Power led.
4) Harddisk activity indicator.
5) Network activity led. This led show activity on either ethernet, GSM/GPRS and Tetra (if installed).
6) System fans.
7) Mini-USB.
8) USB.

2.1.1   Power LED signals

The power LED serves two purposes; to show the current operating mode of the power supply and to indicate error modes and warnings from said power supply. Operating modes are shown with continuous blinking patterns. Errors and warnings are displayed using a repeating blinking pattern. This pattern consists of a number of slow blinks, followed by a noticable pause. Depending on the nature of the error or warning, the pattern is shown just once or continuously.

Power state indications:
- •   10 sec blink: power off
- •   3 sec blink: power standby
- •   5x/sec blink: harddrive heating in progress
- •   2.5x/sec blink: powerup/ shutdown delay
- •   1.5x/sec blink: shutdown watchdog

Error and warning signals:

3 blinks:	low battery detected, button disabled
4 blinks:	shutdown by watchdog
5 blinks:	loaddump protection
7 blinks:	internal overvoltage
10 blinks:	system temperature too cold for starting
11 blinks:	system controller watchdog reset
12 blinks:	system controller low voltage reset

2.1.2   Fans

Speed of te system fans is regulated based on the highest temperature in the system. The system controller measures temperatures near the harddrive, temperature of the CPU heatsink and the air inlet temperature, just behind the fans.

The four dual color LEDs behind the fans have programmable color sequence. This sequence defaults to a green to red gradient that reflects the system temperature.

2.1.3   Button lockout

Note that the power and reset buttons can be disabled using the system configuration. In that case the appropriate warning signal will be shown on the power LED when the button is pressed.

2.2   Backpanel connections UNIGO
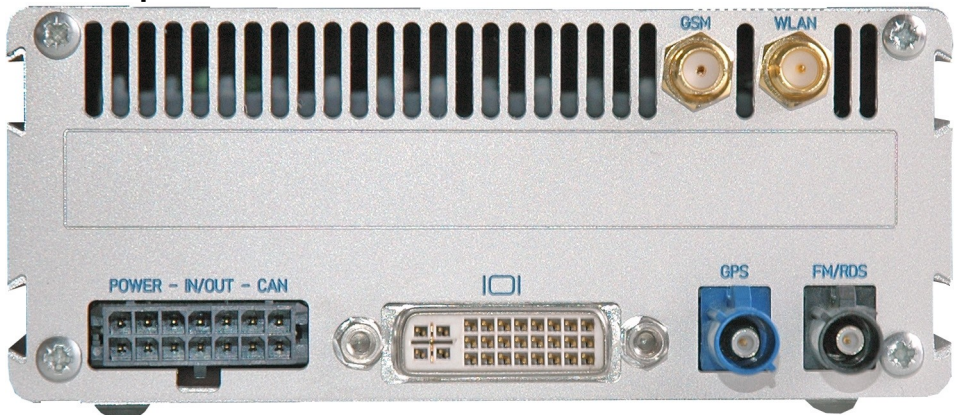
1)   Power connector and i/o signals.

2) All-in-one monitor connection.
3) CAN connector (formerly FM/RDS connection).
4) GPS antenna connection.
5) Mounting holes for optional connections like GSM/GPRS, WLAN/BT antenna, auxiliary.

2.2.1   Rearvideo feature

A factory installed solder jumper can enable a passthrough connection from the CAN1 connection to a signal on the DVI connection. This passthrough enables the autodetection feature of the monitor to show a composite video signal, for example a rearview camera.

2.2.2   Silent CAN1 feature

Default configuration for the CAN1 port is to operate in silent mode. This mode disables all transmission of data onto the CAN bus by physically disconnecting the transmit signal to the bus transceiver.

2.3   Backpanel connections UNIGO/QUSB
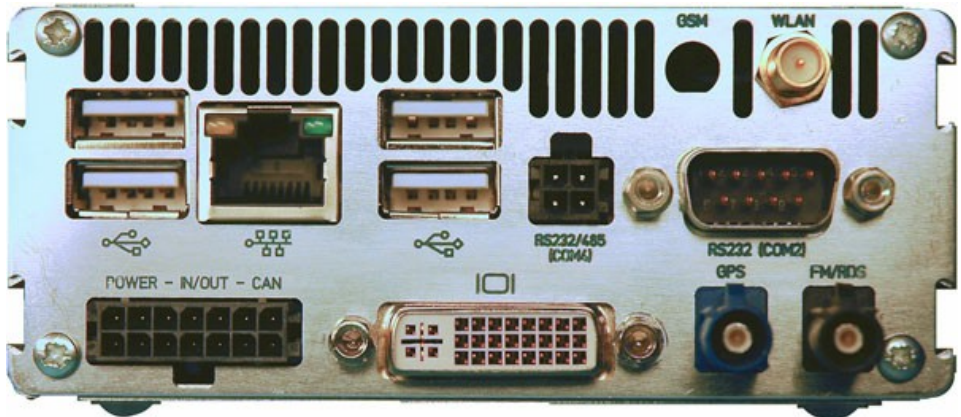
In addition to the basic backpanel connections, this model has the following additional connections:

6) High-Speed USB (4x).
7) 10/100Mbps Ethernet.
8) Selectable RS232A/RS485 with power on 4-pin MicroFit.
9) RS232C with optional 5V or 12V on pin 9 (Ring Indicator) of SubD connector.

The I/O board has 4 standard USB connections. These are powered and protected in pairs of two with 1.1amps thermal fuses.

2.3.1   RS232 pin9 power jumper

Please refer to paragraph 4.1.1 for instructions on opening the case and appropriate ESD precautions.

2.4   Backpanel connections UNIGO/QSER
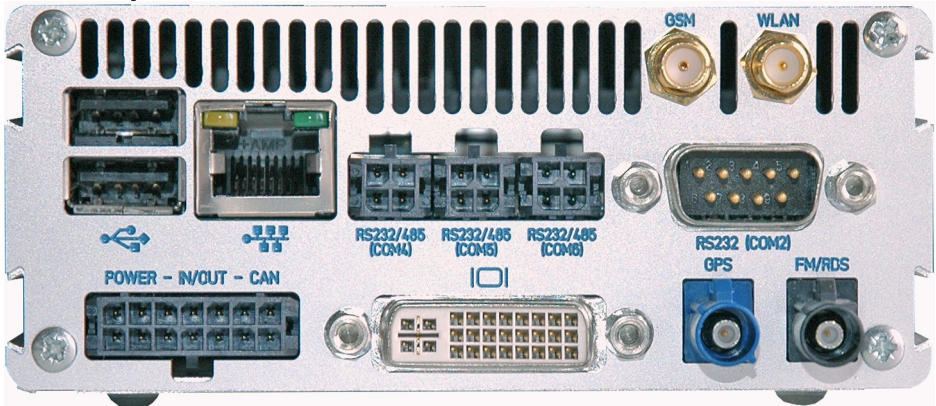
In addition to the basic backpanel connections, this model has the following additional connections:

6) High-Speed USB (2x).
7) 10/100Mbps Ethernet.
8) Selectable RS232A/RS485 with power on 4-pin MicroFit (3x).
9) RS232C with optional 5V or 12V on pin 9 (Ring Indicator) of SubD connector.

3   Specifications

3.1   Electrical

Parameter	Min	Typ	Max	Unit
Vbattery	9		33	VDC
Vbattery (short duration)	6.5		36	VDC
Vbattery (emergency shutdown)			50	VDC
Battery current (fused)			10	A(F)
Lowside output, current			1.3	A
Highside output, current			0.4	A
Lowside input, active voltage			360	mV
Highside input, active voltage	2.5			V
Tacho input frequency		tbd		Hz
Light input voltage range	0	41.4		V
VGA Power, voltage	VBATT	12		V
VGA Power, current			1.5	A

3.1.1   Power connector pinout

Pin	Color	V3.4 [*]	V3.5 [*]	Description
1, 2	black	Ground		Ground
3	orange	Remote/CAN1 H	Remote	System on/off control / Canbus 1 signal (default off)

[*] Hardware versions: V1.x has serial number xxxxx2010xxxxxxx and below, V3.0 to V3.4 have S/N xxxxx2011xxxxxxx and above, V3.5+ has S/N xxxxx201326xxxxx and above

Pin	Color	V3.4	V3.5 *	Description
4	brown	Brake/LIN		Active-high input signal / LIN serial port signal
5	pink	Mute[L]/Out5[L]/CAN1L	Mute[L]/Out5[L]	Ground contact input / lowside output / Canbus 1 signal
6	green	Reverse[L]/Out6[L]/CAN2L		Ground contact input / lowside output / Canbus 2 signal
7	violet	Out3(Aux)[H]		Highside output
8, 9	red	Battery		Battery power
10	white	Out1(Slave)[H]		Default active when system on
11	gray	Tacho		Input for measuring frequency
12	yellow	Light		Input for measuring voltage
13	green/red	Out4[H]/CAN2H	CAN2H	Highside output / Canbus 2 signal
14	blue	Out2(Antenna)[H]		Highside output

- • [H] = Highside output
- • [L] = Lowside input or output (ground referenced)

3.1.2   CAN connector pinout

Pin	Color	V3.5+ *	Description
1	yellow	Out4[H]	Highside output
2	green	CAN1H	Canbus 1 signal
3	white	CAN1L/Rearvid	Canbus 1 signal or rearvideo input
4	brown	Ground	Ground

For rearvideo functionality, please refer to section 2.2.1.

3.1.3   4-Wire serial port pinout

4-Wire serial connections are only applicable to systems with QUSB or QSER I/O module installed.

Pin	Color	Name	Description
1	yellow	VSEC	Switched battery power with reverse blocking diode and 500mA polyfuse.
2	green	TxD	RS232 transmit signal
3	white	RxD	RS232 receive signal
4	brown	Ground	Ground

3.1.4   GPS antenna power

Hardware version	Voltage	Current
V1.x	5.0V	10mA
V3.x	3.3V	10mA

3.2   Environmental

Parameter	Min	Max	Unit
Operating temperature range	-10	+50	°C
Limited time temperature range	-20	+80	°C
Non-operating temperature range	-40	+100	°C
Humidity (non condensing)	5	95	%

3.2.1   Temperature ranges

• Operation above 80C will result in frequent shutdown of CPU, thereby preventing damage to the system. The system will wear very quickly, lifespan can get reduced to only a few months with non-stop operation at such temperatures.

• Short term operation 50C to 80C (175F) system can boot and run at high temperature. Prolonged operation will increase failure rate. CPU may activate thermal throthling to reduce it's power consumption. This results in temporary reduced system performace.

• Normal operation 5C to 50C (40F – 120F).

- With heater -10C to 5C (14F) a short burst of energy increases the temperature of the (liquid) harddrive bearings, followed by a regular boot.

- With heater -20C to -10C (-4F) up to 2 restarts may occur during booting from HD due to rapid evaporation of heat induced to the bearings, solid state should be fine. Risk for corrupted registry with regular OS installation caused by hard reset from bootwatchdog intervention (no CargoSystem activity detected within 3 minutes after power-on).

- With heater -40C to -20C (-40F) watchdog restarts may occur during booting, booting from a regular HD unlikely to work. Also need 'burnin' selection test to qualify CPU and peripherals at low temperature.

- Below -40C, operation is not predictable. Operation at such ambient need external heating elements to keep temperature at acceptable level.

One of the warranty disclaimers will limit the acceptable operation at high temperatures, like continuous unprotected operation in a desert or similar. Future system hardware and/or firmware may have ambient recorder to limit warranty claims due to damage caused by such operation.

3.3   Compliance

Please refer to annex C

3.3.1   GSM/GPRS

Contains GSM/GPRS modem transmitter module
FCC ID: MIVGSM0308

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.

3.3.2   GSM/HSDPA

Contains GSM/GPRS/HSDPA modem transmitter module
FCC ID: MIVGSM???

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.

4   Installation

Before the system can be used, it should be installed into the vehicle securely. Running the system with non-mounted parts is strongly discouraged, except for testing purposes in a non-moving vehicle.

4.1   System unit

It is important to secure the system to the vehicle in a reasonably secure way. When dangling around, the system may bounce, giving mehanical damage, wiring damage or harddrive problems. In adition, a loose system may give very hazardous situations in case of a car accident. To be on the safe side, it is highly recommended to mount the system in a location from where it can never hit a passenger or window in case it would be projectiled forward.

Select a location with sufficient space to mount the system and route the wiring. The mounting spot should be large enough not to block the air intake on the front, or the exhaust ports on the back. In addition a location with minimal dust accumulation is recommended, so mounting the system behind the dash is strongly preferred over mounting under the seats for example

When installing the system, make sure to allow for enough slack in the wiring so that the system can be removed again without excessive effort. With many connectors it is easier to install then than to remove them, so being able to connect the wires does not mean they can be removed as easily as well. So having enough cable beind the unit, maintenance will be much easier.

4.1.1   Opening the case

Open the case by removing the four phillips screws on the back. Then the system core can be pulled from the case. If this does not come out easily, then it is recommended to use a USB plug inserted in the front USB to push the first few millimeters. After that the rearpanel edge provides enough grip to pull further. Pull on the bottom edge next to the DVI connector to prevent bending of the panel.

4.1.1.1   General ESD precaution

ANTISTATIC PRECAUTIONS
The internals of the system are static sensitive components. When installing cards or add-ons to the system, it is strongly recommended to use an antistatic benchmat and wriststrap. If this is not possible, at least make sure you always touch the uncoated edge of the mainboard just, and each time before you touch anything else. That way any buildup charge will dissolve into the ground where it cannot do damage.

Moving vehicles can develop very high voltage static charges. It is impossible to protect electronics against such charges. Normally, this is no problem since these charges do not affect the interior of the vehicle. Only when leaving the vehicle, this carge can get discharged.

But when parts of the system are installed in such a way that someone outside the vehicle can easily access it, chances occur that the vehicle charge will discharge through the exposed electronics, possibly resulting in permanent damage.

Whenever connections or controls need to be placed in the vicinity of doors or windows (thus allowing easy access without touching other parts of the vehicle first), it is strongly recommended to provide measures to ensure the operator has to come in contact with the metal body of the car before coming into contact with those connections or controls.

4.1.2   GSM SIM card or CF card

In order to install a SIM card for the GSM/GPRS subsystem, or to use a CF storage card, the case must be opened. Typically, this is much more convenient to do before the system is build into the vehicle.
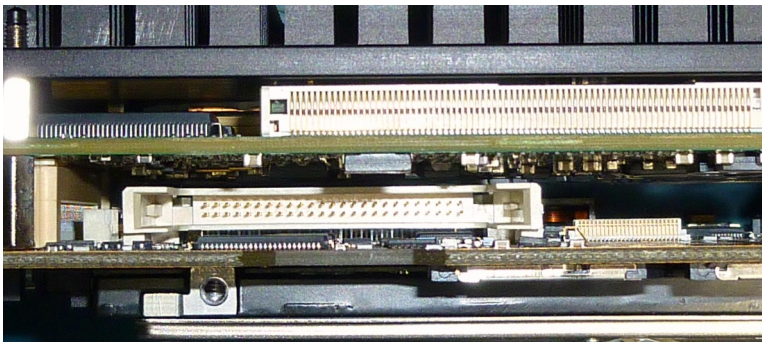
4.1.2.1   SIM Card

Two SIM card sockets are provided on bottom of the mainboard, one for the factory installed GSM/UMTS modem, and a second for optional radio's such as PCI-express based UMTS or Tetra. These are marked "GSM/GPRS" and "PCIe" respectively.
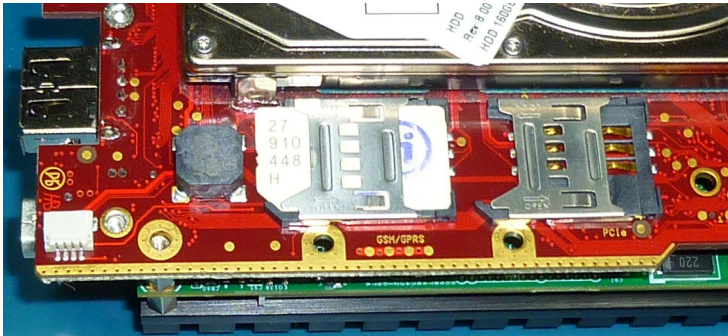
4.1.2.2   CF Card

The CF socket is located between the mainboard and the CPU module assembly and accessible from the left side.

The cut-out (visible in the bottom right of the SIM card holder photo above) in the mainboard allows for easier removal of the CF card. Use a small screwdriver to pull on the tiny edge of the CF card to extract it from the socket.
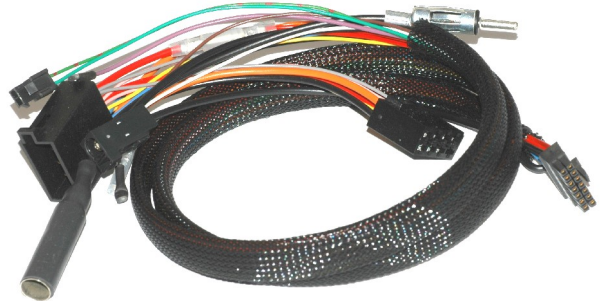
4.1.3   Power connection

Caution: Always make sure the wiring harness is protected with a fuse (typical 10Amp)! Not having a fuse at the beginning of the wiring harness may lead to fire hazard when the wires get damaged or cut. Keep in mind that a piece of sheared metal (due to road accident) will cut through any wire, no matter how carefully it was positioned. And if there's one thing worse than finding yourself in a wrecked car, then it's in a wrecked car on fire...

The ISO cable plugs into the standard car radio power connection. This connection is always fused within the wire harness of the car, so no additional fuse is needed. Depending on the stock connections in the vehicle, some adapter cables may be required to connect the cable to the vehicle.

Some cars have a different wiring scheme. On these cars the permanent and switched 12V inputs must be reversed for proper operation, otherwise the operating system will not be able to perform a proper shutdown. Normally the bullet connectors near the ISO plugs are connected to their similar colored counterparts. To perform the modification, unplug both bullet connectors and connect the yellow plug to the red socket and vise versa. Typically this modification is needed on all Vauxhall, Volkwagen, Audi, Seat and Skoda cars.
<picture of swapped power wires>

4.1.3.1   CAN2 & Brake connection

Some small pigtail wires are included with the power cable. The single brown wire should be connected to the handbrake (ground referenced) switch. This signal can be used as a video blocking source to prevent motion picture in a moving vehicle. The two-wire green wire assembly is intended for connection to a CAN bus. Currently this has no function.
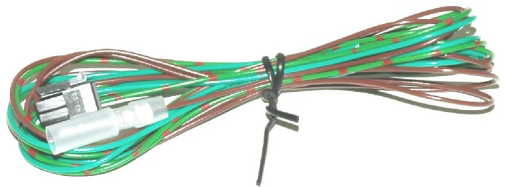
Both wire assemblies connect to their equally collored counterparts on the ISO cable assembly.

4.1.3.2   CAN1 and 4-Wire serial port connection
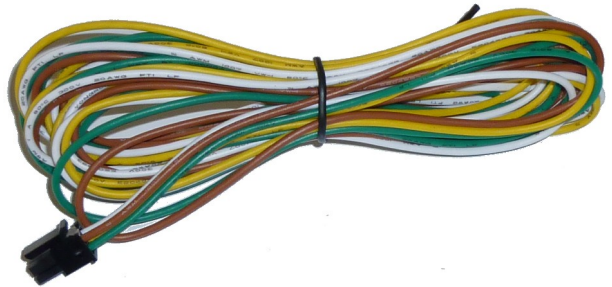
4.1.4   Mounting flanges

With the optional mounting flanges, the system can be mounted onto a flat surface easily. The flanges slide into the dovetail rails on the sides of the case and are secured with small setscrews to prevent them sliding out. Large openings on the bottom side of the flange allow for mounting with screws, bolts or tiewraps.

4.2   Display unit

Some displays have a USB hub build-in, which allows for connection of a USB device on the back of the monitor. However, due to BIOS limitations, it is not possible to have legacy keyboard or mouse emulation on these ports, or to use bootable USB devices. Once the USB-aware OS has loaded, this is not a problem since the OS provides it's own drivers to access and use those devices.

4.2.1   DVI connection

Standard configurations of the system do not provide the digital video signals on the DVI port. Therefore only standard VGA monitors can be used (by means of a DVI-VGA adaptor plug).

4.2.2   Display cable

The cable for the display is available in lengths of 1.5 meters and 3 meters. Additionally, a 2-meter extension cable is available to realize video connections of 3.5 and 5 meters. The USB connection in the cable limits the total length to 5 meters. With some special provisions, we are able to carry all relevant signals to the monitor, including the power.

<picture of MDR connector mounting>

4.3   Antenna placement and connections

GPS antenna   GSM antenna   2.4GHz antenna

4.3.1   GPS antenna

For best signal quality the antenna should be mounted on the roof of the vehicle, or on a similar metal surface with clear view to the sky. When no suitable metal surface is available, some metal scrap can be used to install under the antenna. A simple 7cm

diameter disk of ferrous metal is already enough to improve the received signal strength significantly.

4.3.2   GSM antenna (optional)

– The antenna must be installed to provide a separation distance of at least 20 cm from all persons;
– The antenna shall be installed according antenna manufacturer instructions.

When used within North America, the following rule applies to the antenna location:
– The antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

WARNING
RF exposure. Keep at least 20 cm
(7.9 in) separation distance from
the antenna and the human body.

4.3.3   WLAN antenna (optional)

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5   Power supply

No computer system can work without a power supply. And in a vehicle environment, the power supply is even more important. It must operate over a wide range of voltages and tolerate a lot of hazards. In addition, it must enable automated operation of the system so that no or minimal operator control is required.
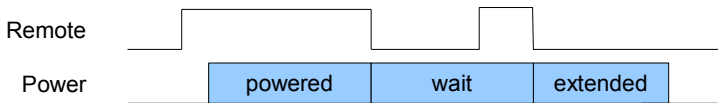
5.1   Control signals

5.1.1   Remote event
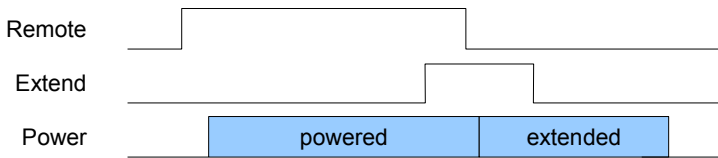
The remote event is the most important feature of the power supply. This event automates powering and shutting down of the system by means of one or more input signals.

5.1.2   Extend event

When the system is about to commence the shutdown, it will check for the extend signal, if that one is configured. In addition, the extend event can be activated manually by toggling the remote signal. When the extend mode is engaged, the system will continue to run for a certain amount of time, configurable up to ~4 hours.

5.2   Parameters

The power supply has a lot of parameters which control the behaviour of the system.

5.2.1   Powerup delay

The powerup delay is a selectable wait between activation of the remote input and the actual powerup signal. This allows for some settling of power plugs lige sigarette lighter sockets. With a time too short, it is possible that the system is already getting powered

while the user is still inserting the plug. This is not a problem for the system, but the high current can cause sparks between the plug and the socket which will wear the contacts quickly. Other uses for the powerup delay is to back off current consumption until a (diesel) engine is running.

5.2.2   Shutdown delay

Interruptions of the remote input that are shorter in duration than the shutdown delay are ignored.
In addition, this delay facilitates activation of the extend time; if the remote input is activated again for a short time during the shutdown delay period, the system will go in extended power mode. This extended power time is increased by the extend time parameter for each short activation during this delay time. The frontpanel led blinks slowly during this delay.

5.2.3   Default extend time

Some installations may require the system to remain powered for a while after the remote or ignition signal has been turned off. This can be done with the default extend time. With this parameter set, the system will always remain powered for the selected amount of time.

5.2.4   Extend time

Extend time defines an optional extra time of remaining powered after the remote signal is deactivated. This can be used in conjunction with the default extend time. The extend time can be activated by toggling the remote input line, or with an input signal that is high while the remote signal goes down.

5.2.5   Standby power

This parameter should remain off. Having this on will result in much higher standby power consumption.

5.2.6   Harddisk heater

The system has a build-in heater for the harddrive bearing. This heater is activated upon system start when the temperature is below 5 degrees. When no harddrive is used, the heater can be disabled, which saves some booting time at cold temperatures.

5.2.7   Remote signal configuration

Normally there is just the remote input to trigger powerup and powerdown events of the system. But the other input signals can be configured to serve as an additional remote input. In that case, the two (or more) signals are OR'ed together to one event.

So the first one to become active will start the system and the last one going inactive will start the shutdown.

To prevent rendering the system inaccesible, the default remote (ignition) signal cannot be disabled as a remote control event signal. However, leaving it unconnected will yield the same result if desired anyway.

Note that the BRAKE and the REVERSE inputs are active low signals. They can be used as active high signals by connecting a small light bulb in parallel with the inputs, but this will increase the powerdown current consumption by ~1mA at 12V or ~2mA at 24V for each input.

5.2.8   Extend time signal configuration

One or more inputs can be selected to activate the extended power mode upon release of the remote control signal(s).

For example the light input can be used to activate the extend time if the lights are still on when ignition is turned off. But when the lights are turned off before the ignition, then the system will shutdown directly.

5.2.9   Low battery voltage

This low battery setting is used to monitor the input voltage when the system is running in extended power operation, or when the system has been turned on with the frontpanel power button. When the remote input is active, only the lowest 8.5V setting is used. This reduces unwanted shutdowns caused by voltage drop on the power lines, especially when using (lesser quality) sigarette lighter connections.

5.3   Watchdogs

5.3.1   Boot watchdog

The boot watchdog timer is started when the system is powered. When no activity is detected on the internal communication bus, the system is power cycled, assuming a hang during booting.

This watchog is enabled only after a first activity is detected and the battery remained connected between last powerdown and powerup. Also, the watchdog is disabled after the third boot attempt.

5.3.2   Shutdown watchdog

The shutdown watchdog is a 3-minute timer which is started when the shutdown pulse is issued to the operating system. When this timer expires and the system has not been turned off by the OS, then the power will be cut and an error code is shown on the power LED.

5.4   Low battery protection

The power supply has three different low voltage detections:

Detection level 1 is always active and issues an immediate hard shutdown when the input voltage gets below 6.5 volts.
Detection level 2 is always active also and issues a gracefull shutdown when the input voltage has been below 8.5 volts for 2 minutes.
Detection level 3 can be configured between 8.5 and 34.0 volts. The time delay for this detection is also 2 minutes. When the remote/ignition signal is active, this detection level is disabled.

When the system has been shut down because of a low battery event, the frontpanel power LED will show a 4-blink pattern, also, the reason for shutdown will be written to the Windows event log upon next system boot.

5.5   Configuration screen

Windows XP: the configuration screen can be found at Control Panel > Power Options > PSU settings.
Windows Vista: the configuration screen can be reached at Settings > Control Panel > Power Options > Change Plan Settings > Change advanced power settings > PSU settings. Or use Run > "powercfg.cpl ,1" > PSU settings.
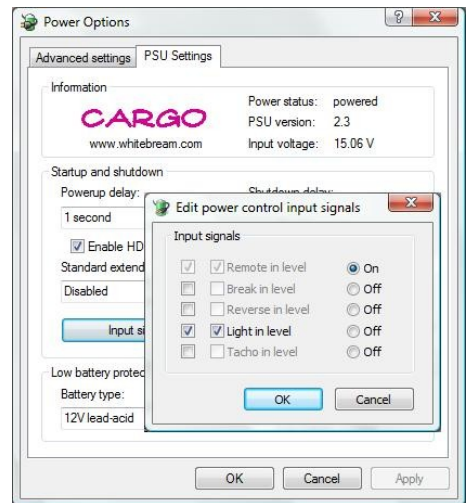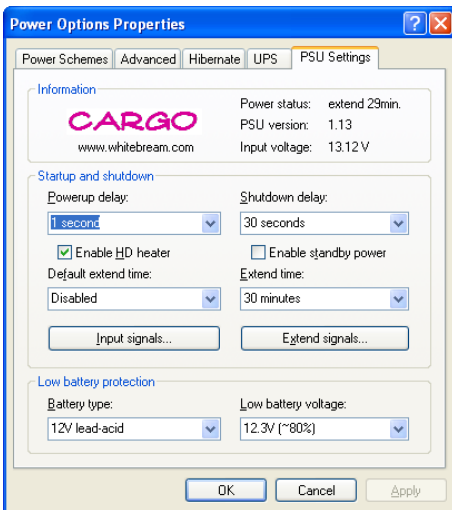
5.6   Command-line programming

A simple command-line utility is provided with the installation of CargoSystem to facilitate easy configuration of the power supply parameters with a script or batch file.

•	Psu version	PsuCfg VER	
•	Input voltage	PsuCfg VBI	
•	Power state	PsuCfg PST	
•	Poweron delay	PsuCfg POD 0/1/2/5/10/15/30	(seconds)
•	Powerdown delay	PsuCfg PDD 1/5/15/30/60	(seconds)
•	Default Extend time	PsuCfg EMD OFF(0)/5/15/30/60/120/MAX	(minutes)
•	Active Extend time	PsuCfg EMA OFF(0)/5/15/30/60/120/240	(minutes)
•	Disk heater	PsuCfg HDH ON/OFF	
•	Standby mode	PsuCfg SBM ON/OFF	
•	Lowbat detect level	PsuCfg LBL 85-340 (x 0.1V)	
•	All defaults	PsuCfg ALL CLR	

5.7   Backup battery option

Sometimes systems need to be used in a configuration that does not allow for permanent battery connection. Typically this are configurations that draw the power from a sigarette lighter socket. Usually it is recommended to allow the system to shutdown gracefully unless special precautions have been taken to prevent a corrupted registry or filesystem. So pulling the power while the OS is still running may cause problems on the next boot.

To cover such situation or simply to allow some more data collection or communication, a special battery pack is developed, which can be connected between the power source and the system. The batterypack consists of a simple lead-acid battery, a battery charger and a take-over circuit. When the main power source is cut, the remote (ignition) signal will drop as if the system were connected in the usual way. And since the battery takes over the power to the system, the system can continue to run for a certain time.
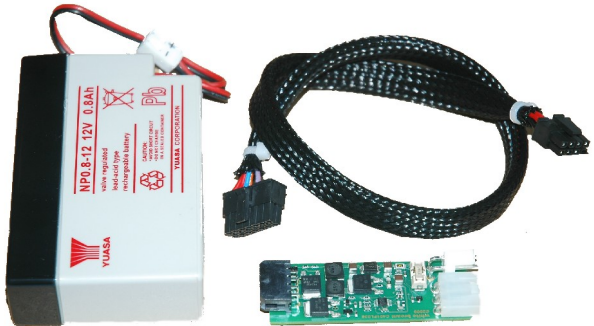
Typically the backup battery comes with a 800mAh battery, which allows for some 15 minutes or running. When the system is powered, this battery is charged with a current

of ~250mA, so the chargetime is about 3-4 hours. Larger batteries can be used as well, which gives proportionally longer running and charging times.

The carger can work with any input voltage, but the resulting battery charge is limited to approximately 0.5V higher than the main power voltage. So to archive a fully charged backup battery, the main power wiring should be of reasonably good quality to prevent excessive voltage drop.

Annex A: System BIOS

– Award BIOS, please refer to C401RP303.pdf
– AMI BIOS, please refer to C401RP305.pdf

Annex B: Hardware mappings

B.1   Serial ports

COM1.   Wired to GPS receiver, 38400bps N81,
COM2.   Available to I/O board,
COM3.   Oxford port 1, Wired to GSM module port,
COM4.   Oxford port 2, Available to I/O board
COM5.   optional Oxford port 3, Available to I/O board,
COM6.   optional Oxford port 4, Available on 8-pin expansion connector.

B.2   PCI bus

•   NEC USB controller uPd720101 *
•   Oxford serial controller OXuPCI952 òr OXuPXI954

B.3   SmBus

•   tbd

B.4   System I2C bus

•	Baseboard tag eeprom 24LC02	0xA0 / 0xA1
•	I/O board tag eeprom, location 1 (default) 24LC02	0xA8 / 0xA9
•	I/O board tag eeprom, location 2 24LC02	0xA4 / 0xA5
•	I/O board tag eeprom, location 3 24LC02	0xA6 / 0xA7
•	Power supply controller	0xB0 / 0xB1 *
•	Fan controller TC654	0x36 / 0x37 *
•	FM Tuner on Cargo I/O board Si4703	0x20 / 0x21
•	AM/FM Tuner on Cargo I/O board Si4731	0x22 / 0x23
•	Mixer device on Cargo I/O board TDA7416	0x8C / 0x8D

*) Removed on hardware version 3.x

Annex C: Certifications

C.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

C.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.

C.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
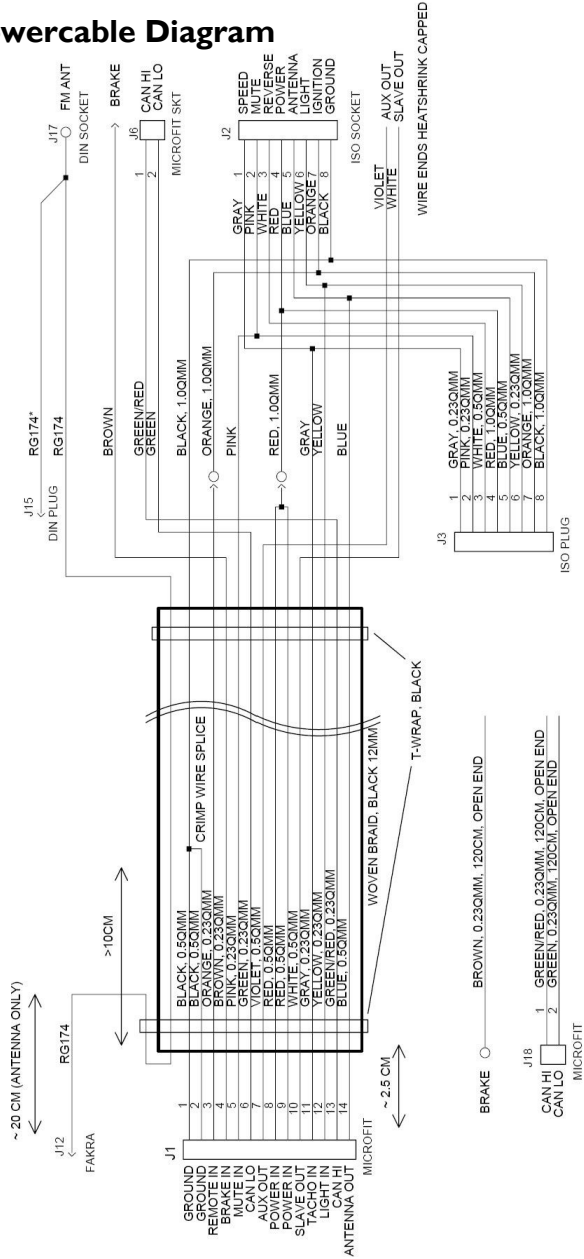Consult the dealer or an experienced radio/TV technician for help
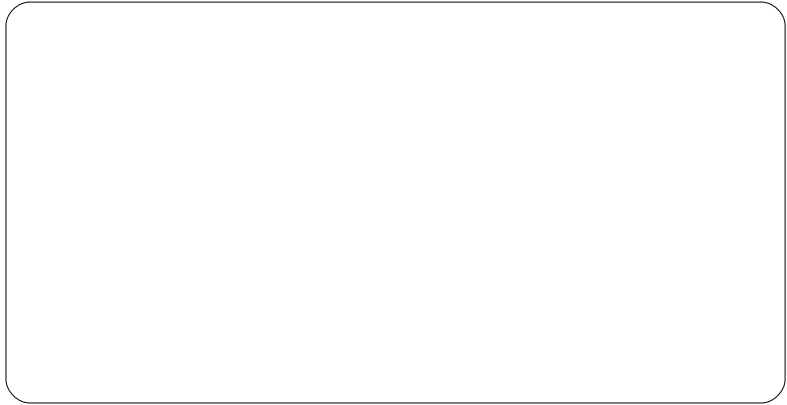
C.4   Underwriter Laboratories

The CARGO/UNIGO computer system is designed to be compliant with UL requirements for product safety. However, no testing or validation has been done to access this compliance.

Annex D: FAQ

Q   Serial ports 3 and 4 (or 3 to 6) appear on different COM numbers after booting.
        Also Windows often detects an unknown PCI device.
A   This tends to happen with systems that are not permanently on power, and
        which suffer a dead CMOS battery. Because of BIOS modification, the system
        still appears to start as usual, but normally the BIOS would have halted with a
        "CMOS checksum error, press F1 to continue" message.

Annex E: Powercable Diagram