

# Aculab GroomerII

1U chassis

Installation guide

MAN1024 Revision 1.2



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# 1 Getting started

## 1.1 Unpacking and assembly

### 1.1.1 Chassis packaging

The shipping box contains the following accessories:

- Two IEC 60320 type C13 power cords or two DC power cords
- Standard 19 inch rack locating brackets
- GroomerII installation and utilities CD
- PC Anywhere installation pack
- USB to serial adapter
- Keyboard
- Mouse

The chassis packaging is made from material which can be recycled.

### 1.1.2 System location

The chassis must be installed in a restricted access location in accordance with IEC 60950-1: 2005 Clause 1.7.14.

### 1.1.3 Rack mounting 19 inch equipment

#### WARNING

The chassis weighs up to 10kg. The weight should be taken into consideration when equipment cabinets and mounting hardware are purchased and installed. Consult your company health & safety procedures and policies for guidance on lifting and handling.

Care must be taken to prevent a hazardous condition due to uneven mechanical loading.

The unit is designed to be mounted on side rails or a shelf inside a 19 inch cabinet.

The rack mount brackets at the front of the unit are designed to hold the rail or shelf supported unit in place after installation.

If a sliding mounting is used, adequate strain relief should be provided to all cables to prevent damage when the unit is moved.

### 1.1.4 Airflow and cooling

**CAUTION**

The chassis uses forced air-cooling internally. It is imperative that systems are operated with all covers fitted and that none of the ventilation holes/slots on the front or rear of the chassis are obstructed. Installation in a rack should be such that the airflow required for safe operation is not compromised.

When rack mounted in a closed or multi-unit cabinet, the operating environment of the cabinet may be greater than the room ambient. In this case consideration should be given to maintaining an operating environment that does not exceed 40 °C.

All airflow is front to rear.

### 1.1.5 Power connections

The system is supplied as either an AC or a DC powered system. The system will auto adjust to the supplied voltage in AC and DC installations (100 to 240 volts AC ± 10% at 50 to 60Hz ± 3Hz or -36 to -72 volts DC). The unit will generate a continuous audible alarm if switched on with a single power cord. The internal power supply is rated at a maximum of 250W, however the unit is designed to consume no more than 150W during normal operation (see Appendix E).

Read the safety information in Appendix B: before installing any equipment.

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### 1.1.6 Connecting AC power

Standard IEC 60320 type C13 power cords provide the AC power and earth connections. Both modules must be connected to provide power module redundancy.

### 1.1.7 Connecting DC power

The DC power modules have a Positronics polarised socket. DC cables include the matching polarised plug, populated with two colour coded large gauge leads, which are terminated with fork connectors. These leads should be connected to a suitable DC supply as follows:

Lead	Connection
Black	0V (+V)
Yellow	-48V (-V)

**CAUTION**

Observe the correct polarity for DC power connections.

Both modules must be connected to provide power module redundancy.

### 1.1.8 Earth connection

Reliable earthing of rack mounted equipment must be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit, such as mains distribution strips that are typically located inside equipment cabinets.

### 1.1.9 Electrostatic discharge precautions



During installation and maintenance, handle all connectors by their plastic casing or connector shield. Do not touch metal parts within any socket as you plug connectors in.

Before plugging in any interface cables, ground yourself to dissipate any static charge you may be carrying. To do this, ensure the power and earth leads are correctly installed then briefly touch the exposed metal on the power modules at the rear of the chassis.

These precautions will minimise the chance of any ESD damage to the system.

## 1.2 1U chassis physical details

The chassis is designed to fit into 19 inch rack mounting cabinets commonly found in telecoms switch room or data centre environments.

	Width	Depth	Height	Weight #
With rack mounts	435mm	450mm	45mm	Approx 10kg
Without rack mounts	430mm	450mm	45mm	Approx 9kg

# Subject to variation between different system capacities

The handles at the front of the chassis protrude beyond the chassis profile by 31mm and the power modules at the rear of the chassis protrude by 13mm.

### Front panel

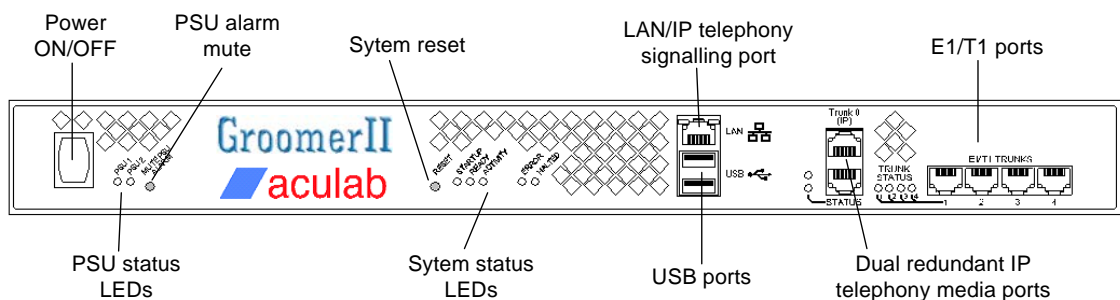
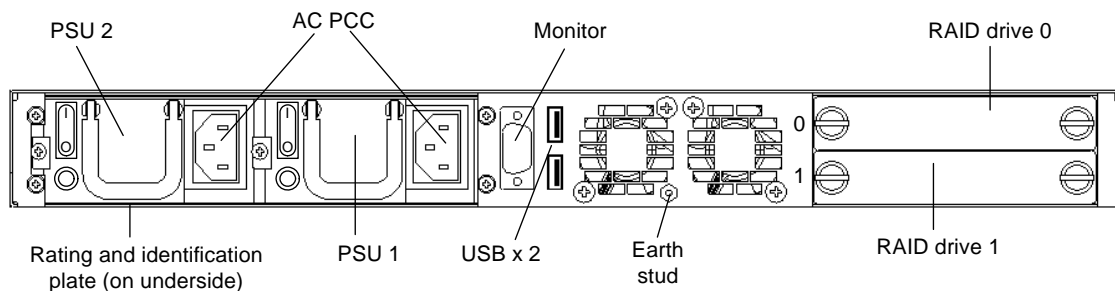


Figure 1-1 1U chassis front layout (4 trunk shown)

The front of the chassis contains the following:

- Power On/Off switch. Depress and release to power on the chassis. Depress and hold down to power off the chassis. The chassis will automatically power off when Microsoft Windows performs a normal shutdown.
- PSU status LEDs. The appropriate LED is illuminated to indicate that a PSU is operational.
- PSU alarm mute switch. When depressed will silence the audible PSU failure alarm. Activated by insertion, for example, with a paper clip.
- System status LEDs
  - Startup. Indicates that the GroomerII application software is in the process of starting, but is not yet ready to process calls.
  - Ready. Indicates that the GroomerII application software is running and able to process calls.
  - Activity. Indicates that the system has calls in progress. The faster this indicator flashes, the more heavily loaded the system.
  - Error. Indicates that the system is in need of attention, and call passing may be impaired
  - Halted. Indicates that the system is no longer able to pass calls.
- System reset switch. Some models present a system reset switch. This switch is not connected, and operating it has no effect.
- Two USB (type A) ports
- LAN and IP telephony signaling Ethernet port
- Two IP telephony media Ethernet ports, configured as a dual redundant pair
- One, two or four E1/T1 trunk ports

## Rear panel



**Figure 1-2 1U chassis rear layout AC power unit**

The rear of the chassis provides access to the following units and interfaces:

- Two AC or DC power modules with folding extraction handles
- Earthing stud
- Two USB (type A) ports
- Two hot swap HDD carriers
- Monitor VGA port



Each AC power module is fitted with an IEC 60320 type C14 socket and a power On/Off switch.

Each DC power module is fitted with a Positronics polarised socket and a power On/Off switch.

#### NOTE

The rating label for the power supply is fitted underneath the chassis.

### 1.3 Powering the system on

Connect power cords to the system according to the following procedure:

- Check that the electrical outlet is grounded and it is within the permitted range shown on the rating label.
- Ensure both power supplies are switched to the off (0) position at the rear of the chassis.
- Plug both power cords into the AC or DC power inlet sockets on the rear of the chassis.
- Connect the other ends of the power cords into suitable electrical outlets.
- Connect E1/T1 or Ethernet network cables as required. The type of cables and connectors used depend upon the interface mix contained with the system.
- Once all cables have been connected, both power supplies should be switched to the on (1) position at the rear of the chassis.
- The system may now be powered up by momentarily pressing the power button on the front panel.

### 1.4 Powering the system off

An active system can be placed into a low power standby state by momentarily pressing the power button on the front panel.

In the standby state, the unit can be reactivated by momentarily pressing the power button on the front panel.

To completely remove all power from the unit, press the rocker switches on both power modules at the rear of the chassis to the off (0) position.

It is recommended to maintain a 30 second gap between each power off and power on cycle.

### 1.5 E1/T1 trunk numbering

Each E1/T1 trunk connector is assigned a unique number. These numbers are assigned sequentially beginning at one. The front panel labelling identifies the trunk numbering.

## 1.6 Ethernet connections

Each Ethernet connection has a unique MAC. Please consult the specific application documentation for information on configuring IP addresses.

The VoIP media interfaces are designed to connect to full duplex Ethernet switch equipment, which can sustain the required data throughput with little or no packet loss. There are two VoIP media interfaces as this can offer additional redundancy, if required, in a correctly configured network. Assuming both interfaces are connected and have valid layer 1 connections, the system will default to one interface to carry VoIP media rather than performing load sharing.

Design of a redundant Ethernet network is beyond the scope of this document, however at a minimum, each VoIP media interface would connect to a separate Ethernet switch.

## 1.7 Cabling

The system is connected to other network equipment via CAT 5, 5e, 6 or 6e cables. There are two types of interface and they have different pin assignments.

The pin-out of the RJ45/48 connectors for both E1/T1 and Ethernet connections are detailed below. For E1/T1 and 10/100 Ethernet connections :

Receive on the system should be connected to transmit on the network equipment.  
Transmit on the system should be connected to receive on the network equipment.

Cross-over cables will be required in instances where two connector sockets with the same signal pinouts are connected together.

### NOTE

E1/T1 crossover cables are wired differently to 10/100 Ethernet crossover cables

For Gigabit Ethernet connections, there are four pairs of signals, each transmitting data in both directions. Cross-over cables are not normally required for Gigabit Ethernet connections due to auto-sensing procedures built in to the interface electronics.

### NOTE

Shielded cables are recommended in all instances.

Ample strain relief should be fitted when installing all cables, both signal and power. Any damage caused by inadequate strain relief to cards or power connectors will not be covered by your warranty.

Both E1/T1 and Ethernet cables may be connected and disconnected while the unit is active.

Bear in mind that disconnecting an active E1/T1 trunk will cause an alarm condition both within the GroomerII unit and at the corresponding network end of the cable. You may wish to check with the network operator if there is a requirement for advance notification of E1/T1 trunk installation and maintenance.

## 1.7.1 Cable pinouts

### 120 Ohm E1 or 100 Ohm T1

The 8-contact RJ45 Plug on the cable between each E1/T1 trunk and the 100 or 120 Ohm network trunk must be wired as follows:

Pin	Signal	Direction
1	Rx+	input
2	Rx-	input
4	Tx+	output
5	Tx-	output

### 10/100Base-T (IP Telephony Media)

The 8-contact RJ45 Plug on the cable between the card and a 10/100Base-T network must be wired as follows:

Pin	Signal	Direction
1	Tx+	output
2	Tx-	output
3	Rx+	input
6	Rx-	input

Cat 5 cabling is recommended for 10/100Base-T Ethernet connections. All eight wires are normally populated on off the shelf Ethernet patch cables.

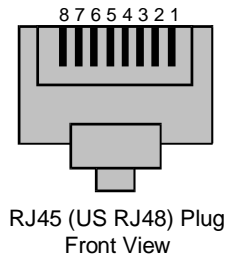
### 1000Base-T (LAN/IP Telephony Signalling)

The 8-contact RJ45 Plug on the cable between the card and a 1000Base-T network must be wired as follows:

Pin	Signal	Direction
1	BI_DA+	bidirect
2	BI_DA-	bidirect
3	BI_DB+	bidirect
4	BI_DC+	bidirect
5	BI_DC-	bidirect
6	BI_DB-	bidirect
7	BI_DD+	bidirect
8	BI_DD-	bidirect

Cat 5E, 6 or 6E cabling is recommended for 1000Base-T Ethernet connections, as this will provide superior noise immunity over longer cable lengths, compared to Cat 5 cabling.

### Connector orientation



**Figure 1-3 RJ45 pin numbering**

Cat 5 cabling is recommended for 120 and 100 Ohm trunk connections.

### 1.7.2 75 Ohm E1 trunk connection

**NOTE**

Each E1 trunk in an GroomerII chassis has configurable impedance

Some legacy E1 PSTN networks require 75 Ohm trunk connection. The default impedance for E1 trunks in the system is 120 Ohm. It is important to confirm with the network operator which impedance the PSTN is using during the installation process, as a mismatch can lead to signal degradation and erratic equipment behaviour that is difficult to diagnose later.

The following signalling services may be expected to be configured for 75 Ohm in legacy switching equipment which provide the following protocols :

- DASS2
- DPNSS
- SS7/ISUP
- All E1 CAS protocols

Each 75 Ohm trunk is normally connected via a pair of coaxial cables with BNC connectors. A Balun is available to convert between RJ45 and co-axial cabling. The Balun also converts between 120 and 75 Ohm interfaces, so the system does not need to be configured for 75 Ohm operation when this type of converter is used.



**Figure 1-4 75 Ohm E1 Balun**

**NOTE**

The RJ45 patch cable must provide electrical ground continuity via the cable screen.

For installation convenience, the Balun converter may be located at either end of the interconnection – so for example it may be convenient to use available RJ45 patch panels to route the trunk connection, and locate the BNC converter adjacent to the legacy equipment.

**1.7.3 Cable lengths**

Cat 5 cabling is designed for an overall span length of 100m. It is recommended that the length of either a single point to point cable, or the cumulative length of multiple cables which may be connected via a patch panel does not exceed 100m. For span lengths approaching the 100m recommended limit it is important to specify and install high quality cables.

For E1 trunks converted to BNC cabling, it is recommended that overall span length is limited to 100m maximum and that 75 Ohm cabling and connectors are used.

Span lengths in excess of 100m may continue to operate, in this case the installer should check that there is adequate margin on signal levels to maintain expected service levels.

**1.8 Ethernet equipment legacy compatibility**

The GroomerII VoIP Signalling Ethernet interface is designed to operate at Gigabit Ethernet data rates. If connected to network equipment that is not Gigabit capable, the interface will attempt to negotiate the highest data rate available.

The VoIP media interfaces are designed to operate at Fast Ethernet (100Base-T) data rates. If connected to network equipment that is not Fast Ethernet capable, the interface will attempt to negotiate a 10Base-T link speed. In most cases this will impose an artificially low channel count on VoIP connections that will limit the system capacity.

**CAUTION**

The VoIP media interfaces should not be connected directly to legacy “hub” (half duplex) network equipment.

**1.9 Serial port**

The chassis has no external serial port, and is instead provided with a USB – Serial adapter. This can be inserted into any USB port, and will be presented as COM2.



**Figure 1-5 USB to serial adapter**

## 1.10 System initialisation

The system start-up process will run automatically at power on, and will start the GroomerII application. Please refer to the User Guide for system configuration options.

## 1.11 Initial hardware checks

When system is turned on, the STARTUP indicator will turn on and the unit will go through the initialisation sequence. When complete, the READY indicator on the front panel will turn on.

## 1.12 Cabling checks when system is operational

You can check the continuity of the cabling by looking at the connection state of each interface via the GroomerII Status Monitor. The Status Monitor will start automatically when the system is initialised. Full details of Status Monitor views are included in the GroomerII User Guide.

An E1/T1 trunk with No Signal detected (NOS) means either open circuit on the receive path or the paths are crossed i.e. RX connected to RX and TX to TX

An E1/T1 trunk with Remote Alarm Indication Detected (RAI) normally means the receive path is good but the transmit path may be open circuit.

All connected trunks must show good Layer 1 status before you attempt to pass calls through the system.

The User Guide provides additional detail about trunk and Ethernet configuration and troubleshooting.

## 1.13 Common set-up problems

### 1.13.1 System TDM clock not configured

Where one or more E1 or T1 trunks are connected to network equipment, correct operation depends on TDM clock synchronisation.

A common set-up problem concerns the configuration of the system TDM clock which is required to synchronise the system to other E1/T1 equipment. This should be set to recover the clock from a network source or PSTN, where available.

It is not possible to synchronise one Groomer II to multiple network sources that are not synchronised to each other. An example of this scenario can be two or more E1/T1 trunks, each connected to a separate carrier network.

### 1.13.2 ISDN network/user conflict

Many E1/T1 ISDN signalling protocols have asymmetric user and network end configurations. The configuration for each E1/T1 ISDN interface can be changed via the Aculab Configuration tool (ACT).

### **1.13.3 CAS network conflict**

Some E1/T1 CAS signalling protocols have configuration settings that may prevent correct operation if there is a mismatch between the system and the network. Please consult the local E1/T1 network operator for CAS signalling requirements. The configuration for each E1/T1 CAS interface can be changed via the Aculab Configuration Tool (ACT).

### **1.13.4 Ethernet IP address conflict**

All Ethernet end points in a network require a unique IP address. Consult the network administrator if there is an IP address conflict.

### **1.13.5 Ethernet IP address out of range**

All Ethernet end points in a network require a valid and unique IP address. Consult the network administrator for information on the available range of IP addresses.

## 2 Hardware maintenance

### 2.1 Servicing

There are no user serviceable parts inside the chassis. The unit may optionally be powered off for inspection every year and to remove any dust that accumulates internally. This should only be performed by qualified technical personnel.

### 2.2 Power module replacement

The power modules have individual MTBF predictions of over 85000 operating hours. In the event of single power module failure, a continuous audible alarm is generated in the unit. The failed unit can be identified both from the front and rear of the chassis by the absence of the normal green “module healthy” indicator. Power module operation can also be checked by accessing the system status page via the application specific browser interface.

A power module may be removed and replaced with a spare while the unit is operating. If a spare module is not immediately available, the audible alarm may be silenced by pressing the recessed switch on the front panel marked “Mute PSU Alarm”.

The unit will continue to operate with a single power module. The remaining power module becomes a single point of system failure while operated in this non-redundant configuration. Long term operation with a single power module is not recommended as this puts additional thermal strain on the remaining module.



#### CAUTION

Observe electrostatic discharge precautions when handling power modules. Do not touch the gold plated connector while replacing a module.

#### CAUTION

Due to residual internal voltage present upon removal of a power module, immediate re-insertion of the same module may result in damage to the PSU. Once a power module has been removed from the system, it must not be re-inserted for at least 1 minute to allow the internal voltages to discharge.



### 2.2.1 Removing a power module

- Confirm the module to be replaced by checking the green LED indicator at the rear of the unit. (do not remove the module showing green for normal operation)
- Switch off the power on the module to be removed.
- Remove the IEC or DC power cord.
- Unscrew and retain the single cross head screw at the left side of the module
- Unfold the extraction handle and pull out the failed module.
- Carry the removed module by the extraction handle

#### CAUTION

The module casing may be up to 50°C immediately after removal so place it in a safe location until it cools down.

### 2.2.2 Replacing a power module

- Confirm the module replacement module is the correct type.
- Check that the power switch is in the off position.
- Insert the module into the rear of the chassis, with the gold connector at the bottom and the power switch on the left.
- Replace the retaining screw at the left side of the module.
- Test for fuse continuity in the IEC or DC power cord, as the failed module may have forced this open circuit.
- Replace with a suitable fuse if required.
- Re-connect the IEC or DC power cord.
- Switch on the power switch on the replacement module.
- Confirm that the green “healthy” indicator lights up.
- Confirm that the cooling fan in the replacement module is rotating.

## 2.3 Cooling fan failure

The unit relies on forced air cooling to maintain the internal electronics within rated operating temperatures. The unit has four main cooling fans visible at the rear plus an additional internal CPU cooling fan. The unit is designed to continue operating with any single fan failure. It is strongly recommended that the unit is scheduled for fan replacement in the event of any fan failure.

Fan failure within a power module can be serviced by replacing the module.

#### CAUTION

Under no circumstance attempt to dismantle a power module to service any internal components, including the fan.

- The unit should be returned to your supplier for internal fan replacement
- Contact your supplier for advice on fan replacement if the unit is out of warranty

## 2.4 HDD replacement

The unit has two hard drives fitted as standard, configured as a redundant RAID 1 volume.

In the event of single HDD failure or extraction, the system will continue to operate. A failed drive may be replaced with an equivalent type and capacity device while the unit is operational. The recommended replacement drive is the Toshiba (Fujitsu) MHY2040BS or MHZ2080BS SATA drive.

If the original type of HDD is no longer available, a replacement with larger capacity may be used.

The procedure for removing a drive is:

- Positively identify the drive to be replaced, via the Intel Matrix Storage manager
- Undo the knurled retaining screws at each end of the disk cover plate
- Grasp the knurled thumbscrews and gently but firmly pull the disk carriage from the chassis

Replacement is the reverse of removal.

### NOTE

Some early chassis were not fitted with hard drive backplanes, and the drives in these systems cannot be hot swapped. Crosshead screws are used in place of the knurled thumbscrews to secure the drive carriers on these systems.

### CAUTION

If a drive is removed and replaced during system operation, even if it is replaced with the same drive, that drive will not become operational until it has been rebuilt. In such circumstances the second drive in the system must not be removed until rebuilding the first unit has completed.

### CAUTION

Inserting a replacement drive that is already formatted as a member of another RAID volume can cause the system to crash. It is recommended that a failed drive should only be replaced with newly formatted or unformatted drive.

The Intel® Matrix Storage Manager user's manual and on-line help describes the process of rebuilding RAID volumes. The system will operate normally during the rebuild process.

## 2.5 Battery replacement

The internal battery is not re-chargeable and has a service expectancy of five years under normal operating conditions. If the battery completely discharges, the system will continue to operate, however time and date information will be lost when the unit is turned off.

Please read the important safety information in Appendix B regarding battery replacement.

## 2.6 Moving an installed system

The system should not be moved while operating. If a system has to be moved, the power must be disconnected to prevent equipment damage or risk to operator safety. Please follow the application specific system shutdown procedure prior to powering down.

## 2.7 Backup and restore

Please consult the GroomerII User Guide for backup and restore options and procedures.

## 2.8 Basic fault finding

The following list provides examples of possible reasons for the unit not operating correctly.

Symptom	Possible cause
Unit does not power up	Check power cabling and fuses. Check power modules are switched on at rear.
Unit generates continuous audible alarm	Check both power modules are present, connected and switched on at rear. Replace faulty unit if required.
Unit generates multiple audible tones	This denotes a serious internal fault that is non-recoverable. Contact supplier to determine service options.
Unit displays Fault indicator on front panel	See user guide – possible configuration or cabling mismatch
Unit displays Error indicator on front panel	See user guide – may require software reload
E1/T1 trunk non-operational	Check layer 1 information via GroomerII Status Monitor. Possible cable disconnection, network/user protocol configuration or incorrect TDM clock recovery/synchronisation configuration.
VoIP signalling interface non-operational	Check LAN cabling and IP address.
No VoIP traffic	Check VoIP media cabling and IP address.

## 2.9 SNMP remote monitoring

Each GroomerII includes remote monitoring appropriate to the system operation. Please consult the User Guide for advice on the available monitoring information.

## Appendix A: Warranty and support

### A.1 Warranty

The standard warranty of 1 year applies to all system components. All cover is return to supplier.

#### NOTE

Please contact your supplier for warranty enquiries.

The standard warranty does not cover damage, deterioration or malfunction resulting from :

- Accident, misuse, neglect, fire, water, lighting, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
- Repair or attempted repair by anyone not authorized by your supplier.
- Causes external to the product such as electric power fluctuations or failure.
- Normal wear and tear.
- Any other causes which do not relate to a product defect.

### A.2 Returns procedure

Under the standard warranty, a faulty system should be returned to your supplier by following their RMA procedure.

### A.3 Spare parts and accessories

Please take a note of the serial number on the system when contacting your supplier for spare parts, and ensure you mention the parts are for a Groomer II 1U chassis.

The serial number is normally located on the underside of the chassis, and is in the form Gxxxx.

Spare and replacement power modules are available from your supplier.

Spare and replacement power cords are available from your supplier.

E1 75 Ohm BNC cable adapter kits are available from your supplier.

### A.4 Contact information

Warranty and support information is provided with your system. Your warranty and support terms will include any specific contact details.

### A.5 Technical support

Always have the serial number available prior to contacting technical support. Please contact your supplier for first line technical support enquiries.

### A.6 GroomerII system configuration

Please refer to the GroomerII User Guide (MAN1015) for information on configuring and operating the system.

## Appendix B: Safety information

### B.1 AC Power requirements

The rating plate details the permitted voltage and frequency range for that particular unit.

#### CAUTION

Under no circumstance connect the system to a power source with voltage or frequency different to that stated. Contact your local supplier for advice if your power input is different to that shown on the rating label.

The system can operate with the following AC power inputs:

Power input type	AC chassis (Amps)
North America – 115VAC 60Hz	6 max, 2 continuous
UK and Europe – 230VAC 50Hz	3 max, 1 continuous

#### WARNING

THIS EQUIPMENT IS NOT DESIGNED FOR USE WITH AN I.T. POWER SUPPLY (A POWER DISTRIBUTION SYSTEM THAT HAS NO DIRECT CONNECTION TO GROUND, AND WHERE THE EXPOSED CONDUCTIVE PARTS OF THE ELECTRICAL INSTALLATION ARE GROUNDED).

### B.2 AC Power cords

The system is supplied with moulded IEC60320 input power cords. Within the United Kingdom these will be ASTA (Association of Short Circuit Testing Authorities) approved power cords with moulded 13A 3 Pin plugs. These should be fused at 5A.

Within Europe these will be moulded 3 Pin plugs with suitable European agency approval marks. Additionally the cords will be <HAR> marked.

Within North America these will be moulded 3 Pin plugs with UL and CSA type approval.

The power cords supplied will be terminated suitable for your local requirements. In cases where no plug is fitted or if a plug needs to be changed, the plug may only be fitted by a person competent to fit a plug of the type suitable for the required power outlet. If a power cord needs to be replaced, an appropriately approved power cord must be used.

### B.3 DC Power requirements

There is a DC power option which operates from a nominal -48VDC supply.

#### CAUTION

Under no circumstance connect the system to a power source with voltage different to that stated. Contact your local supplier for advice if your power input is different to that shown on the rating label.

The system can operate with the following range of DC voltage inputs:

Power input type	DC chassis (Amps)
-36 to -72 VDC	10 max, 5 continuous

The power supply units on DC models of the chassis are fitted with Positronic connectors. A DC chassis is supplied with two DC power cords terminated with fork connectors for attachment to a suitable DC power supply. Both power cords must be installed to provide protection from single PSU module failure. The DC modules have polarity protection.

Installation and connection to a DC power supply or DC Mains must be performed by suitably qualified and trained personnel, in accordance with the local regulations and the current edition of the National Electrical Code or the Canadian Electrical Code.

## B.4 Circuit definition

The Ethernet (VoIP media and LAN) and USB interfaces are Safety Extra Low Voltage (SELV) circuits. SELV circuits are so designed and protected that under normal conditions the maximum voltage between any two accessible circuit parts, one of which may be body or ground, does not exceed 42.4 volts (peak AC) or 60VDC, even in the presence of a single fault.

E1/T1 interfaces are Telecommunication Network Voltage (TNV) circuits operating within the limits of SELV. The E1/T1 interfaces have transient voltage protection circuits built in.

### NOTE

Where equipment is intended to be electrically connected to other equipment, interconnection circuits shall be selected to provide continued conformance with the requirements of Clause 2.3 of IEC60950-1 for SELV circuits, and with the requirements of clause 6 for TNV circuits, after making connections between equipment.

### NOTE

Make sure that the integrity of the SELV system is maintained when connection is made through any other interface within the system. If in any doubt seek competent advice.

## B.5 Grounding the chassis

The system must be grounded as detailed below:

- Use grounded 3 connection IEC60320 AC power cables (two recommended).
- A permanent earth stud is located at the rear of the chassis. This stud must be connected to the earth connection of the building installation at all times for DC powered systems

## B.6 Serviceable parts

The system has no user serviceable parts inside. The power modules may be replaced if required for maintenance.

## B.7 Lithium battery

The chassis contains a Lithium battery to preserve system time and date while switched off.

The battery life is predicted to be five years under normal operating conditions.

It is recommended that battery replacement is undertaken only by qualified service personnel.

### WARNING

THERE IS A DANGER OF EXPLOSION IF THE BATTERY IS INCORRECTLY REPLACED.

Please consult your supplier for advice on returning a unit for battery replacement.

It must only be replaced by the same or equivalent type that conforms to IEC60086-4 and is approved by UL. The standard battery type is Toshiba CR2032.

Dispose of used batteries according to the manufacturer's instructions.

The system time and date must be re-entered after battery replacement.

## B.8 Regulatory marking

The CE Marking has been applied to the chassis to demonstrate compliance with the following European standards :

EN55022 and EN55024 for electromagnetic compatibility.

EN60950 for electrical safety.

## B.9 USA/Canada federal communication commission warnings

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not installed in accordance with the instruction manual may cause harmful interference to radio communications.

The device complies with part 15 of the rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

No changes or modifications to the GroomerII unit are allowed without explicit written permission from Aculab. Any changes or modifications could void the end users authority to operate the device and invalidate the warranty.

## Appendix C: Sicherheitsvorkehrungen

### C.1 Spannungsversorgung

Das Typenschild gibt die erlaubte Stromstärke und den Frequenzbereich für dieses System wieder.

#### VORSICHT

Schliessen Sie das System unter keinen Umständen an eine andere als die angegebene Stromquelle mit dem vorgegebenen Frequenzbereich an. Setzen Sie sich mit einem für Ihre Region zuständigen Lieferanten in Verbindung, wenn Ihre Spannungsversorgung vor Ort nicht der auf dem Typenschild angegebenen entspricht.

Der system kann für die folgenden Spannungen konfiguriert werden:

Spannungstyp	1U Chassis (Ampere)
Nordamerika: 115VAC 60Hz	6
UK und Europa: 230VAC 50Hz	3

#### WARNUNG

DIESES GERÄT IST WEDER FÜR DEN EINSATZ MIT EINEM NOTSTROMAGGREGAT (EIN SPANNUNGSVERSORGUNGSSYSTEM, DAS NICHT DIREKT GEERDET IST) VORGESEHEN, NOCH DORT, WO DIE EXPONIERTE, LEITENDEN TEILE DER ELEKTRISCHEN INSTALLATION GEERDET SIND.

### C.2 Netzkabel

Zum Lieferumfang des system gehört IEC60320 Netzkabel. Innerhalb des UK handelt es sich um von der ASTA (Association of Short Circuit Testing Authorities) zugelassene Netzkabel mit dreipoligen 13A Steckern. Innerhalb Europas handelt es sich um dreipolige Stecker mit den passenden European Agency Prüfzeichen. Zusätzlich sind die Kabel mit anerkannten Markierungen versehen. Innerhalb Nordamerikas handelt es sich um dreipolige Stecker mit UL und CSA Typenzulassung.

Die mitgelieferten Netzkabel entsprechen Ihren Bedürfnissen vor Ort. Falls noch kein Stecker vorhanden ist oder ein Stecker ausgetauscht werden muss, darf der Stecker nur von jemandem angebracht werden, der dazu autorisiert ist. Wenn ein Spannungsversorgungskabel ausgetauscht werden muss, muss ein dementsprechend zugelassenes Spannungsversorgungskabel verwendet werden.

#### NOTE

Die primäre Abschaltvorrichtung für den system ist derHauptgerätestecker an den Netzkabeln. Diese Abschaltvorrichtung muss auch nach der Installation zugänglich bleiben. Der Power Switch, der sich hinter der verschließbaren vorderen Klappe befindet, darf nur von Servicepersonal benutzt werden.



### C.3 Ein- und Ausschalten der Stromversorgung

1. Stellen Sie sicher, dass der Hauptstromschalter des system auf die **OFF** 'O' Position gestellt ist .  
Der Schalter vom '1U' Chassis befindet sich auf der Hinterseite des Geräts.
2. Verbinden Sie Ihr Spannungsversorgungskabel folgendermaßen mit dem system :
  - a. Überprüfen Sie, ob die Steckdose geerdet ist und ob sie sich innerhalb des erlaubten Bereiches befindet, der auf dem Leistungsschild angegeben ist.
  - b. Stecken Sie das Spannungsversorgungskabel in die Wechselstrombuchse (IEC60320) auf der Rückseite des system.
  - c. Stecken Sie das andere Ende in eine geerdete, dreipolige Steckdose.
  - d. Erden Sie das Chassis durch die Erdungsschraube auf dem Gerät mit einem passenden Erdungspunkt. Stellen Sie sicher, dass die Verbindung elektrisch einwandfrei ist.
  - e. Verbinden Sie alle E1/T1 oder Ethernet Netzkabel nach Bedarf. Die Art der verwendeten Kabel und Stecker hängt vom Interface-Mix ab, das im system enthalten ist.
  - f. Wenn alle Kabel angeschlossen sind, kann der system an den Strom angeschlossen werden indem Sie den Stromschalter auf die ON Position schalten.  
Es ist empfehlenswert, zwischen dem Abschalten und Anschalten bei laufendem Betrieb.30 Sekunden zu warten.

### C.4 Definition des Stromkreises

Die genauen Einzelheiten zur Sicherheit und Zulassung der Karte können Sie im Specific Cards Installationshandbuch nachlesen.

Die Ethernet-Ports (Network Interface) sind Safety Extra Low Voltage (SELV) Stromkreise. SELV-Stromkreise sind so ausgelegt und geschützt, dass unter normalen Bedingungen die maximale Stromstärke zwischen zwei beliebigen zugänglichen Teilen des Stromkreises, von denen jeweils einer Masse oder Erde sein kann, 42.4 Volt (maximale Wechselstromstärke) oder 60VDC nicht überschritten wird, auch wenn ein einzelner Fehler vorhanden ist.

ISDN Signalisierungs-Stromkreise sind Telecommunication Network Voltage (TNV) Stromkreise die den Bedingungen von SELV entsprechen. Die ISDN Interface verfügen über eingebaute Starkstrom-Schutzschaltungen.

#### NOTE

Wenn Sie eine elektrische Verbindung zwischen den Gerät en herstellen möchten, sollten Sie 'Interconnection Circuits' wählen, um zu gewährleisten, dass die Anforderungen von Klausel 2.3 des IEC60950 für SELV-Stromkreise, und von Klausel 6 für TNV-Stromkreise dauerhaft eingehalten werden, nachdem Verbindungen zwischen den Geräten hergestellt wurden.

#### NOTE

Stellen Sie sicher, dass die Integrität des SELV-Systems aufrechterhalten wird, wenn eine Verbindung durch irgendeinen anderen 'Interface Port' innerhalb des Systems hergestellt wird. Bei Unklarheiten wenden Sie sich bitte an unsere qualifizierten Mitarbeiter.

## C.5 Elektrostatische Entladung

Fassen Sie alle Stecker an ihrem Kunststoffgehäuse oder ihrer Steckverbindungs-Abschirmung an. Berühren Sie beim Anschließen von Steckern keine Metallteile innerhalb irgendeiner Buchse.

Bevor Sie irgendwelche Interface-Kabel anschliessen, erden Sie sich, um sich gegebenenfalls antistatisch zu entladen. Dazu berühren Sie die Rückseite des system-Gehäuses für einige Sekunden.

Durch diese Vorkehrungen verringert sich die Gefahr, dass ESD-Schäden am system auftreten, drastisch.

## C.6 Erdung des System

Der system muss folgendermaßen geerdet sein:

Für die Wechselstromanbindung:

- Die Verwendung eines geerdeten, dreipoligen Stromkabels des Typs IEC60320.

Für die Gleichstromanbindung:

- Der Sicherheitserdung muss mit jedem Anschluß des Gleichstromeingangsstecker verbunden werden.

Zusätzliche Erdung:

- Erden Sie das chassis durch die Erdungsschraube auf dem Gerät mit einem passenden Erdungspunkt. Stellen Sie sicher, dass die Verbindung elektrisch einwandfrei ist. Dies ist ein zusätzlicher, funktioneller Erdungspunkt.

## C.7 Wartungsteile

Der system beinhaltet keine Teile, die vom Benutzer gewartet werden müssen. Stellen Sie sicher, dass der chassis in einem kühlen, gut belüfteten Raum aufgestellt wird.

## C.8 Regulatorische Warnungen

Das CE-Prüfzeichen gewährleistet, dass der GroomerII den folgenden europäischen Standards entspricht.

EN55022 und EN55024 für elektromagnetische Kompatibilität.

EN60950 für elektrische Sicherheit.

## C.9 Warnungen der Federal Communication Commission der USA und Canada

Das Gerät wurde geprüft und entspricht den Bestimmungen für digitale Geräte der Klasse A in Teil 15 der FCC-Vorschriften. Diese Standards ermöglichen einen ausreichenden Schutz vor Interferenzen, wenn das Gerät zu kommerziellen Zwecken genutzt wird. Dieses Gerät kann hochfrequente Energie erzeugen, verwenden und abstrahlen, und kann bei nicht den Anweisungen entsprechender Installation und Verwendung zu Funkstörungen führen.

Das Gerät entspricht den in Teil 15 der Vorschriften angegebenen Bestimmungen. Der Betrieb hängt von den folgenden zwei Bedingungen ab:

- Dieses Gerät darf keine Störungen verursachen, und
- dieses Gerät muss jede Art von Störung annehmen, die es empfängt, auch eine Störung, die unerwünschten Betrieb verursachen könnte.

Am system dürfen keine Veränderungen oder Modifikationen vorgenommen werden, wenn diese nicht ausdrücklich schriftlich von Aculab genehmigt wurden. Jegliche

Veränderungen oder Modifikationen könnten die Autorität des Endkunden beim Betrieb des Gerätes nichtig machen.

## Appendix D: Earthing requirements for Scandinavia

Finland "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"

Norway "Apparatet må tilkoples jordet stikkontakt"

Sweden "Apparaten skall anslutas till jordat uttag"

Denmark "For tilslutning af de øvrige ledere, se medfølgende installationsvejledning"

## Appendix E: Technical Specifications

Operating temperature: 5 deg to 40 deg Celsius

Minimum storage Temperature: -20 deg Celsius

Operating humidity: 5% to 85% non condensing

Storage humidity: max 90% non condensing

AC power input voltage: 90 to 264 VAC

AC power input frequency: 47 to 63Hz

DC power input voltage -36 to -72 VDC

Maximum rated power consumption: 250W

Typical steady state power consumption: 150W

Standby power consumption: 10W

Power factor correction to IEC-1000-3-2 class D

E1 Trunks meet ITU G.703/G.704 recommendations

- Configurable 120 or 75 Ohm termination

T1 Trunks meet ANSI T1.403 recommendations

- Fixed 100 Ohm termination

## Appendix F: Approval details for european union countries & UK



### Declaration of Conformity

We

**Aculab PLC**

of

**Lakeside**

**Bramley Road**

**Mount Farm**

**Milton Keynes MK1 1PT**

**United Kingdom.**

Declare under our sole responsibility that the product

**Aculab Groomer 1U**

To which this declaration relates, is in conformity with the following directives

- Radio and Telecommunication Terminal Equipment (RTTE) Directive 1999/5/EC
- Restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS recast) directive 2011/65/EU

Signed:   
Location: Milton Keynes  
Date: 21<sup>st</sup> December 2012

Position: Managing Director

ROHS/RTTE QMS-08 December 2012