1U High Availability Chassis

Installation guide

Revision 1.4

aculab

PROPRIETARY INFORMATION

Document Revision

Rev	Date	By	Detail
1.0	20/06/2012	DS	Initial release to QA
1.1	05/07/2012	DS	Ethernet port priority added
1.2	21/01/2013	CJB	Max power rating updated, FRU spares added
1.3	04/09/2014	EBJ	Updated format and WEEE information added.
1.4	05/11/2015	CJB	DC power information updated

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1 Getting started

1.1 Unpacking and assembly

1.1.1 Chassis packaging

The Prosody X 1U HA box contains the following accessories:

- Two IEC 60320 type C13 power cords (for AC chassis only)
- Standard 19 inch rack locating brackets (fitted to chassis)
- Four low profile adhesive feet (fitted to chassis, removable)

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

1.1.2 Prosody X 1U HA 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 may also be located on a shelf in a 19 inch cabinet

1.1.4 Free standing

The unit is also suitable for free standing operation, in which case the standard rack mounting brackets may be removed. In free standing installations care must be taken to provide adequate strain relief to all cables to prevent damage to the unit if accidentally moved.

1.1.5 Airflow and cooling

CAUTION

The chassis uses forced air-cooling internally. It is imperative that Prosody X 1U HA 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 temperature of the cabinet may be greater than the room ambient temperature. In this case consideration should be given to maintaining an operating temperature that does not exceed 40 °C.

1.1.6 Power connection AC option

The Prosody X 1U HA chassis can be supplied as an AC powered system. The AC chassis power modules will auto adjust to the supplied voltage in AC installations (90V to 264V AC at 47 to 63Hz).

Each hot-swap power module is rated at a maximum power of 250W, however the unit is designed to consume no more than 125W total during normal operation (see Appendix G).

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 over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

1.1.7 Power connection DC option

The Prosody X 1U HA chassis can be supplied as a DC powered system. The DC chassis power modules require an input -36V to -72V DC.

Each hot-swap power module is rated at a maximum power of 220W, however the unit is designed to consume no more than 125W total during normal operation (see Appendix G).

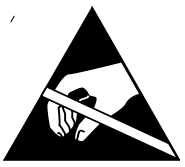
Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

1.1.8 Earth connection

A reliable earth connection 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. See note below:

NOTE
Read the safety information in this document before installing any equipment.

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.

These precautions will minimise the chance of any ESD damage to the Prosody X 1U HA chassis.

1.1.10 Prosody-X 1U HA chassis physical details

The Prosody X 1U HA chassis is designed to fit into 19 inch rack mounting cabinets commonly found in telecoms switch room environments.

	Width	Depth	Height	Weight #
With rack mounts	435mm	550mm	44mm	max 12kg
Without rack mounts	430mm	550mm	44mm	max 10kg

Subject to variation between different system capacities

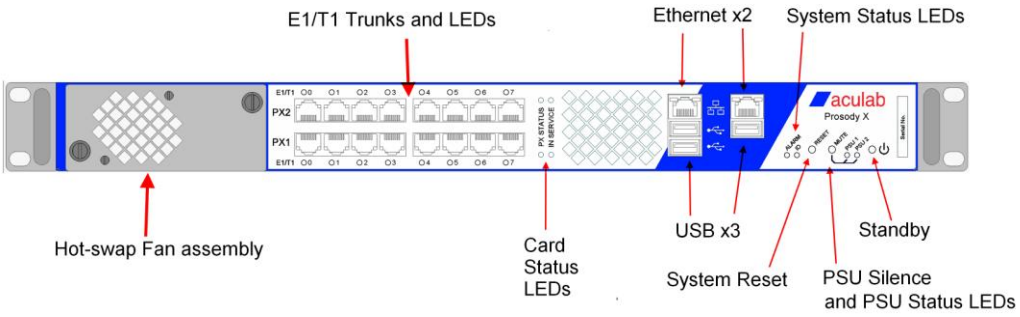


Figure 1-1 Prosody X 1U HA chassis front layout (16 trunk shown)

The front of the chassis presents a panel with the following:

- Two Power Supply indicators
- Up to Sixteen E1/T1 trunk connectors depending on system capacity, with associated LEDs
- Prosody-X Status LEDs
- System Management LEDs
- Two Gigabit Ethernet connectors for Prosody X 1U HA chassis IP communications. See 1.5 below for more details.
- Three USB Interfaces
- Three push-buttons, “Standby (⏻)”, “Mute” and “Reset”
- Hot-swap fan tray

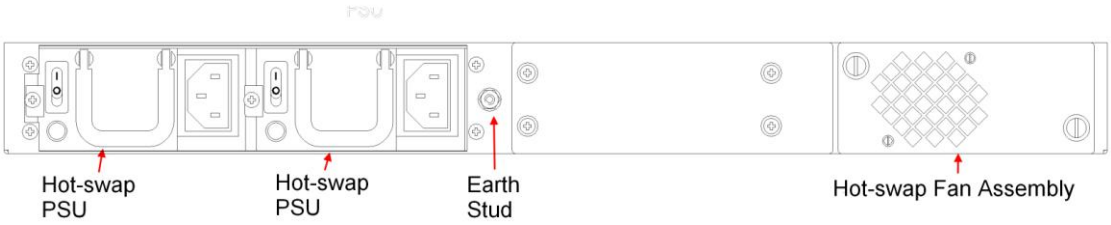


Figure 1-2 Prosody X 1U HA chassis rear layout (AC Input shown)

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

- Two power inlets fitted with either AC IEC socket or DC screw terminals
- Earth stud
- Rating label
- Hot-swap fan tray

1.2 Powering the Prosody X HA 1U on

Connect power cords to the Prosody X 1U HA chassis according to the following procedure:

- Check that the electrical outlet is grounded and it is within the permitted range shown on the rating label
- For the AC chassis, plug the power cords into the AC power IEC inlet socket on the rear of the Prosody X 1U HA chassis

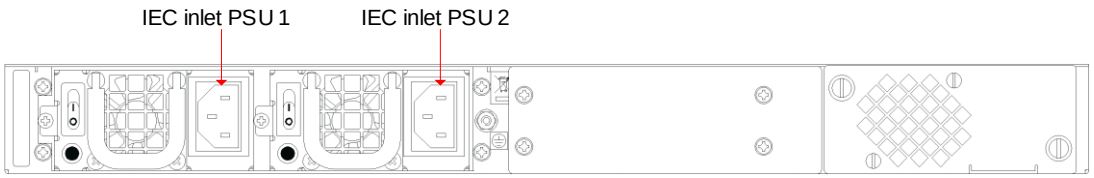


Figure 1-3 AC power inlet connectors

- For the DC chassis, connect a suitably current rated and insulated wire pair to each terminal pair observing the correct polarity, which is labelled as 0V and -48V adjacent to the screw terminals

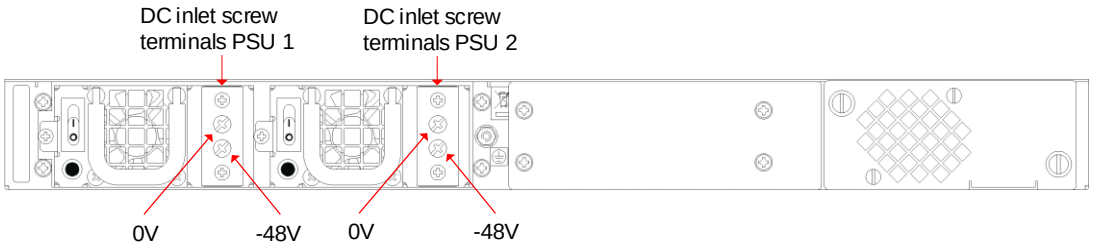


Figure 1-4 DC power inlet terminals and polarity

- Connect the other ends of the power cords/wire pairs into a suitable electrical outlet and turn on the supply
- Switch on both PSU modules at the rear
- Press the “standby” (⏻) button on the front panel
- Each power module has a green LED showing that it is powered up
- Front panel PSU Status LEDs show that both power modules are connected and switched on

NOTE

The Standby button uses the ⏻ symbol on the front of the Prosody X 1U HA chassis.

NOTE

The system may take several minutes to initialise following power on.

1.3 Powering the Prosody X 1U HA chassis off

- The “Standby” button should be used to turn the system power off before removing the power to the system. This will ensure file systems are closed down in an orderly way.
- To completely remove all power from the unit, switch the power supplies off and then disconnect the power cords/wire pairs from the AC or DC inlets.

CAUTION

It is recommended that the “Standby” button is used to turn the system off before power is removed.

CAUTION

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

1.4 E1/T1 trunk numbering

Each Prosody X 1U HA chassis E1/T1 connector is assigned a unique number. These numbers are assigned sequentially beginning at zero. The front panel labelling identifies the trunk numbering.

1.5 Ethernet connections

The Prosody X 1U HA chassis uses multiple IP addresses. Please consult the specific application documentation for information on configuring IP addresses.

The Prosody X 1U HA chassis IP communication 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 Prosody X 1U HA chassis IP communication 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 Prosody X 1U HA chassis will default to one interface to carry IP traffic rather than performing load sharing.

Design of a redundant Ethernet network is beyond the scope of this document, however at a minimum, each Prosody X 1U HA chassis IP communication interface would connect to a separate Ethernet switch.

The Ethernet ports on the Prosody X 1U HA chassis support MDIX, meaning crossover cables are not required.

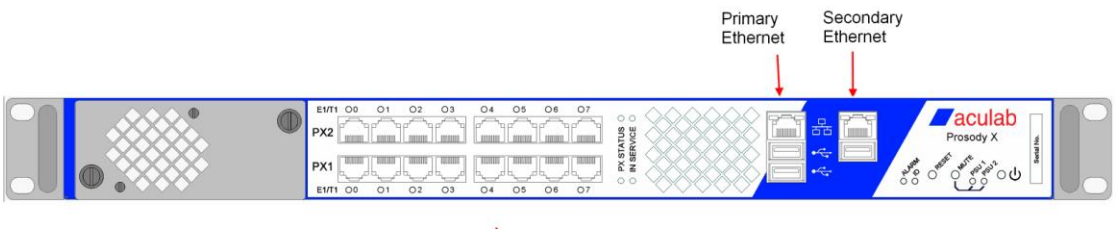


Figure 1-5 Ethernet connections - Primary and Secondary

The primary (left hand) Ethernet port will come into service first, soon after power is applied to the chassis. The secondary (right hand) port will come into service when the on-board system management has booted and initialised.

1.5.1 Ethernet LEDs

The two Ethernet connections have two LEDs.

The right-hand side Green LED indicates a link is present and flashing indicates data traffic.

The left-hand LED, yellow LED indicates link speed, on for 1000-BaseT and off for 100-BaseT.

1.6 Cabling

The Prosody X 1U HA chassis is connected to other network equipment via Cat 5e or Cat 6 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 100BaseT Ethernet connections:

Receive on the Prosody X 1U HA chassis should be connected to transmit on the network equipment

Transmit on the Prosody X 1U HA chassis 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 pin-outs are connected together.

NOTE

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

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 Prosody X 1U HA chassis 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.

CAUTION

When making a telephony network connection, to minimize the risk of fire, only telecommunications line cord of 26 AWG or larger may be used.

1.6.1 Cable pin-outs

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 to chassis
2	Rx-	Input to chassis
4	Tx+	Output from chassis
5	Tx-	Output from chassis

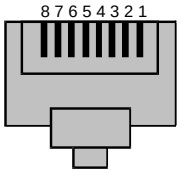
100Base-T / 1000Base-T (Prosody X IP communication)

The 8-contact RJ45 Plug on the cable between the card and a 100Base-T / 1000Base-T network must be wired as follows:

Pin	Signal	Direction
1	A+	Input / Output
2	A-	Input / Output
3	B+	Input / Output
4	C+	Input / Output
5	C-	Input / Output
6	B-	Input / Output
7	D+	Input / Output
8	D-	Input / Output

Cat 6 cabling is recommended for 1000Base-T Ethernet connections. All eight wires are normally populated on off the shelf Ethernet patch cables.

Connector orientation



RJ45 (US RJ48) Plug
Front View

Figure 1-6 RJ45 pin numbering

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

1.6.2 75 Ohm E1 trunk connection

NOTE

Each E1 trunk in a Prosody X 1U HA chassis has configurable impedance.

Some legacy E1 PSTN networks require 75 Ohm trunk connection. The default impedance for E1 trunks in the Prosody X 1U HA chassis 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
- 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 1-7 75 Ohm E1 Balun

1.6.3 Cable lengths

Cat 5e 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 connected via one or more patch panels does not exceed 100m. For span lengths approaching the 100m recommended limit it is important to specify and install high quality cables. In particular for 1000BaseT connections, Cat 6 is recommended for span lengths approaching 100m.

For E1 trunks converted to BNC connectors and co-ax 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 and in this case the installer should check that there is adequate margin on signal levels to maintain expected service levels.

1.7 Ethernet equipment legacy compatibility

The Prosody X IP communication interfaces are designed to operate at Fast Ethernet (100Base-T) or Gigabit Ethernet (1000Base-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 Prosody X system capacity.

CAUTION

The Prosody X IP communication interfaces should not be connected directly to legacy “hub” (half duplex) network equipment.

Modern Ethernet switching equipment operates in a full duplex data mode. It is not recommended to route Prosody X IP communication interface via a network path containing a half duplex “hub” as this will reduce system performance.

1.8 System initialisation

The system start-up process will run automatically at power on.

1.9 Initial hardware checks

When the Prosody X is turned on various LED indicators are used to indicate the state of the system.

The two power supply status LEDs will be illuminated at all times in normal operation.

The Prosody X 1U HA chassis Quick Start guide describes the operation of the other LEDs.

1.10 Multiple Prosody X 1U HA configurations

To configure multiple Prosody X 1U HA chassis, please refer to the AIT/ACT guide.

1.11 Common setup problems

1.11.1 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 setup problem concerns the configuration of the system TDM clock which is required to synchronise the Prosody X 1U HA chassis to other E1/T1 equipment. This should be set to recover the clock from a network source or PSTN, where available. The recovered clock source will default to E1/T1 trunk 0 and may be re-configured to any other connected E1/T1 trunk via the ACT or Switch API.

It is not possible to synchronise one Prosody X 1U HA 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.

1.11.2 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

Other than a Lithium battery, there are no user serviceable parts inside the Prosody X 1U HA 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.

2.1.1 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 E regarding battery replacement.

2.2 Cooling fan failure

The Prosody X 1U HA chassis relies on forced air cooling to maintain the internal electronics within rated operating temperatures. The unit has two field replaceable “Hot swap” cooling fan assemblies, one front and one rear.

A cooling fan failure may be indicated by the openHPI software running on the system.

System software monitors and controls the speed of all these fans. The fan speed will vary as the temperature of the unit changes.

CAUTION

This should only be performed by qualified technical personnel.

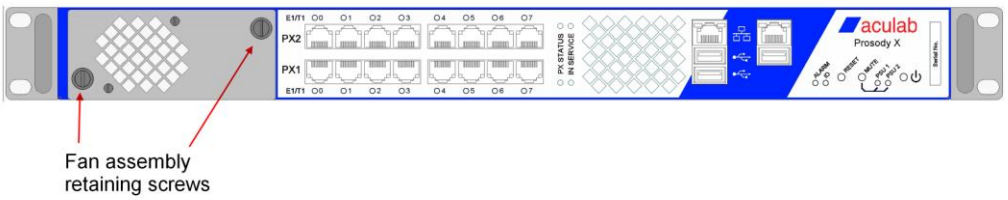


Figure 2-1 Front fan assembly retaining screws

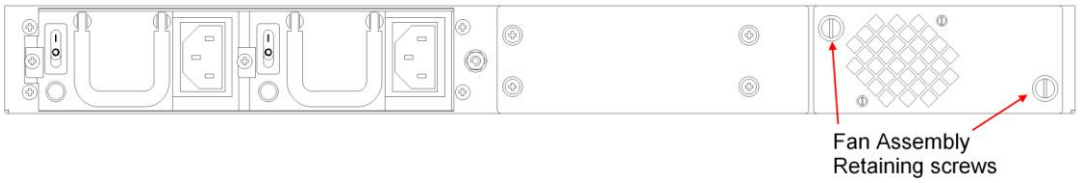


Figure 2-2 Rear fan assembly retaining screws

The fans are removed by simply unscrewing the retaining screws of the assembly with the failed fan and pulling it out. The replacement fan assembly should be replaced without delay. The retaining screws should then be tightened.

Note: the front and rear fan assemblies are not the same.

2.3 Power Module Failure

The Prosody X 1U HA chassis has a redundant power system. LEDs on the front panel and on each power module show the power module is operating. If a single module fails the appropriate LED, marked on the front panel, will go out and an alarm will sound. The PSU LED may also go out, depending on the type of internal failure.

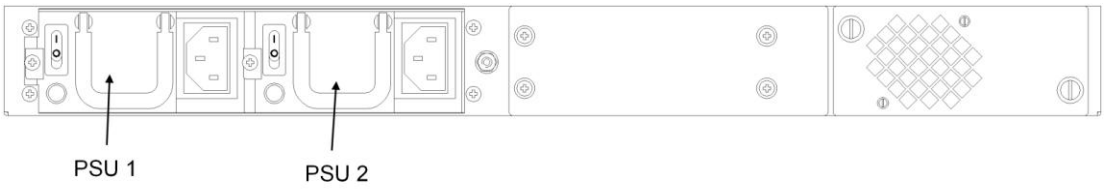


Figure 2-3 Power Supply Unit identification

The failure will be detected by the on-board system software. The audible alarm can be silenced by pressing the “mute” button on the front panel.

The failed power module may be removed without powering the chassis down.

CAUTION

This should only be performed by qualified technical personnel.

To remove the failed power module:

1. Isolate the supply voltage to the failed power module
2. Remove the power cord (AC) or wire pair (DC) from the failed power supply
3. Remove the retaining screw
4. Pull the failed power supply out

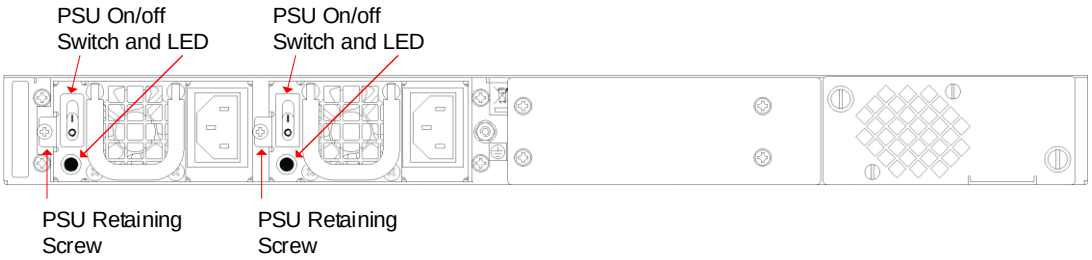


Figure 2-4 AC Power Supply switches and retaining screws

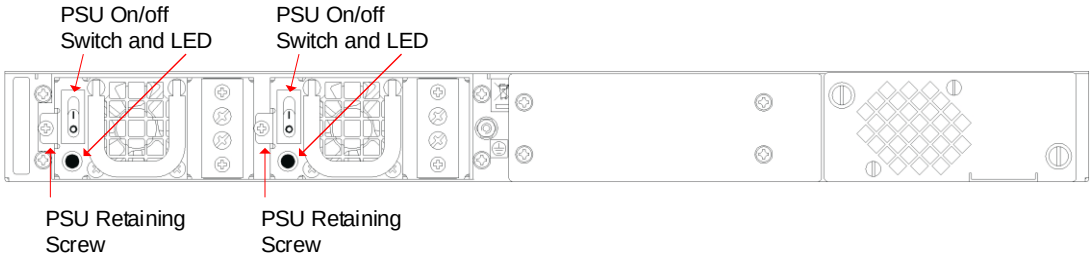


Figure 2-5 DC Power Supply switches and retaining screws

The replacement power module should be fitted in the following sequence:

1. Push the new unit into place, ensuring it is initially switched off
2. Fit the retaining screw
3. Fit the power cord (AC) or wire pair (DC)
4. Turn the power supply on
5. Re-connect the previously isolated supply voltage

The replacement power module LEDs, front and rear should now come on.

2.4 Moving an installed Prosody X 1U HA chassis

A Prosody X 1U HA chassis should not be moved while operating. If a Prosody X 1U HA chassis 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 an operating Prosody X 1U HA chassis.

2.5 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.
E1/T1 trunk non-operational	Check layer 1 information. Possible cable disconnection, network/user protocol configuration or incorrect TDM clock recovery/synchronisation configuration.
No Prosody X IP communication	Check cabling and IP address.

Appendix A: USA/Canada approval details

This section applies only to E1/T1 trunk interfaces configured for T1 operation.

FCC connection requirements

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the exterior of the cabinet of this equipment is a label that contains, among other information, a product identifier in the format **US:AAAEQ##TXXXX.** If requested, this number must be provided to the telephone company.

ACTA Registration Number:	US:5TCXDNAN
Ringer Equivalence Number	(REN): NAN
Facility Interface Code (FIC):	04DU9.1SN, 04DU9.BN, 04DU9.DN & 04DU.1KN
Service Order Code (SOC):	6.0P
USOC Jack Type:	RJ48C

This equipment is designed for connection to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant. See Installation Instructions for details.

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. Typically, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line (as determined by the total RENs) contact the local telephone company.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes to its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice so you can make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact:

Aculab Inc,

Customer Service,

100 River Ridge Drive, Suite 101,

Norwood, MA 02062,

Tel: +1 781 352 3551 / Fax: +1 781 850 4464

There are no user serviceable components in the equipment. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to party line service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

Systems

Facility Interface Codes (FIC), Service Order Codes (SOC), USOC Jack Codes and Ringer Equivalence Numbers (REN) are shown in the table below for each trunk where applicable:

Trunk	FIC	SOC	USOC Jack	REN
Trunk 0 – 15 T1	04DU9.1SN	6.0P	RJ48C	NAN
Trunk 0 – 15 T1	04DU9.BN	6.0P	RJ48C	NAN
Trunk 0 – 15 T1	04DU9.DN	6.0P	RJ48C	NAN
Trunk 0 – 15 T1	04DU9.1KN	6.0P	RJ48C	NAN

UL requirements

This product has been assessed against UL60950-1 and is a listed accessory component under UL file number E178354.

Approval number USA

Approval type	FCC part 68 XD component registration
Approval number	US:5TCXDNAN
Approval holder	Aculab plc, Lakeside, Bramley Road, Mount Farm, Milton Keynes. MK1 1PT, UK

FCC approves the apparatus for connection to public T1 services as specified in the approval certificate, this appendix, and the 'Installation guide' subject to the conditions set out in these documents.

USA 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 Prosody X 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 B: Approval details for UK and other EU countries

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 ProsodyX 1U High Availability chassis

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: Position: Managing Director
Location: Milton Keynes
Date: 10th December 2012

ROHS/RTTE QMS-01 December 2012

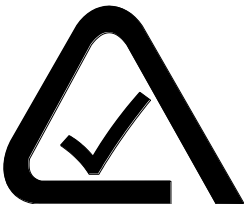
Disposal of equipment at end of service life

Please contact Aculab plc for instructions on how to dispose of this WEEE equipment.

Appendix C: Approval details for Australia

Approval types

C-Tick Mark
(EMC Australia)



A-Tick Mark
(Telecom Australia)

Supplier Identification	N4292
Approval Holder	Approval Specialists

The current contact details for the Australia office is available from the Aculab company web site at www.aculab.com.

Approval by the ACA for connection to primary rate ISDN will be held by Approval Specialists, and subject to the conditions set out in this appendix.

Usage and type

The Prosody X is principally designed for use connected to a 2048 Kbps integrated services digital network (primary rate ISDN) with TS038 signalling including the New Zealand Primary Rate ISDN network (not currently covered by approval).

Other types of private circuit use are also appropriate, and other signalling systems are available.

The Australian approvals are only applicable when the Prosody X is used with Aculab supplied signalling software appropriate for use in the country covered by the Approval.

Approved functionality

- Call initiation
- Call clearing
- Call answering
- Application program generated by the user
- Independent Operation of the network interfaces (one or more interfaces attached to the network)

Appendix D: Warranty and support

D.1 Warranty

The standard warranty of 2 years applies to all Prosody X 1U HA 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.

D.2 Returns procedure

Under the standard warranty, a faulty Prosody X 1U HA chassis should be returned to Aculab PLC by following the Returned Material Authorisation procedure.

D.3 Accessories

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

The serial number is located at the front of each unit.

AC power cords are available from Aculab.

E1 75 Ohm BNC cable adapter kits are available from Aculab

D.4 Contact information

Warranty and support information is provided with your Prosody X 1U HA. Your warranty and support terms will include any specific contact details.

D.5 Prosody X 1U HA chassis technical support

Always have the serial number available prior to contacting technical support.

NOTE

Please contact your supplier for first line technical support enquiries.

General Prosody X information:

www.aculab.com

Appendix E: Safety information

E.1 AC Power requirements

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

CAUTION

Under no circumstance connect the Prosody X 1U HA 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 chassis can operate with the following AC power inputs:

Power input type	AC current (Amps)
North America – 115VAC 60Hz	2.4 max, 1.2 continuous
UK and Europe – 230VAC 50Hz	1.2 max, 0.6 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).

E.2 AC Power cords

The Prosody X 1U HA chassis 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.

E.3 DC Power Requirements

The DC power option 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 chassis can operate with the following DC power inputs (measured at the input terminals):

Power input type	DC current (Amps)
-36V to -72V DC	6 max, 4 continuous

E.4 DC Power cables

DC power cables are connected via the screw terminal blocks at the rear of the chassis. Correct polarity must be observed. The DC modules include protection from accidental reverse polarity connection.

E.5 Circuit definition

The Ethernet (Prosody X IP communication interface) 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 42.4V (peak AC) or 60V (DC), 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.

E.6 Grounding the Prosody X 1U HA chassis

The Prosody X must be grounded as detailed below:

- Use a grounded 3 connection IEC60320 power cable (AC power option)
- Chassis ground stud connection at rear (DC power option)

E.7 Serviceable Parts

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

E.8 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 CR2032 (3V).

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

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

E.9 Regulatory marking

The CE marking has been applied to the Prosody X 1U HA to demonstrate compliance with the following European standards:

- EN55022 and EN55024 for electromagnetic compatibility
- EN60950 for electrical safety

Appendix F: 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 G: Technical Specifications

Operating temperature: 0 deg to 40 °C

Minimum storage Temperature: -20 °C

Operating humidity: 20% to 80% non condensing

Storage humidity: 10% to 90% non condensing

Power:

AC power input voltage: 90V to 264V AC

AC power input frequency: 47 to 63Hz

or

DC power input voltage: -36V to -72V DC

Maximum rated power consumption: 250W (AC), 220W (DC)

Typical steady state power consumption: 125W
Standby power consumption: 2W

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

- Default 120 Ohm termination (75 Ohm configuration option)

T1 Trunks meet ANSI T1.403 recommendations:

- Fixed 100 Ohm termination

Appendix H: Prosody X documentation references

General Prosody X documentation:

www.aculab.com

Appendix I: Field Replaceable Spares

The chassis has field replaceable units as follows:

Part number	Part description
SP0020	Prosody X 1U HA spares kit, AC PSU
SP0021	Prosody X 1U HA spares kit, DC PSU
SP0022	Prosody X 1U HA spares kit, front and rear fan assemblies