

Technical data proAMP310X

RF characteristics		FM ANT input	DAB ANT input	UHF input		
Signal frequency range		87.5 .. 108 MHz	210.5 .. 230 MHz	470 .. 862 MHz		
Forward gain		1.5 dB	4 dB	4.5 dB		
Return path gain		–	–	3 dB (Mode 2 only)		
Noise figure, typical and (max.)		4 (7) dB	3.5 (5) dB	2.5 (4) dB		
Output capability		–	–	82 dB μ V ¹		
Recommended input signal levels	maximum	70 dB μ V	70 dB μ V	78/63 dB μ V ²		
	minimum	50 dB μ V	30 dB μ V	58/43 dB μ V ²		
Isolation between outputs		≥ 30 dB	≥ 27 dB	≥ 24dB		
Input filter rejection ³ for the frequencies (f) stated		≥ 18 dB f ≤ 72 MHz, f ≥ 150 MHz	≥ 22 dB f ≤ 145 MHz, f ≥ 305 MHz	≥ 26 dB f ≤ 400 MHz		
Power requirements		Mode 1	Mode 2			
DC power: voltage limits		8.5 ⁴ .. 18 ⁵ V	10.5 ⁴ .. 18 ⁵ V			
Current loading	amplifier only	80 mA	120 mA			
	full system	110 mA (incl. 30 mA preamplifier load)	220 mA (incl. 100 mA total 'eye' load ⁶)			
External power outputs ⁷		UHF preamp: 5 V approx. at 30 mA max.	IR 'eye': 9 V approx. at 10 mA max. (x10)			
General characteristics						
Signal connector type	Type-F (IEC 60169-24)					
Operating temperature range	-10 .. +40 °C					
EMC standard	BS EN 50083-2:2001					

Notes

1. UHF signal handling capability is given for 5 analogue TV channels plus up to 6 DTT multiplexes at ≤ -14 dB relative level.
2. The first (higher) figure is for analogue signals and the second (lower) is for digital (16- or 64-QAM).
3. Rejection figures are given relative to the nominal passband gain.
4. Absolute minimum voltage, measured to the bottom of the ripple present.
5. Highest recommended mean voltage for operation over the full temperature range.
6. Eye load should be restricted to 80 mA or less when using proPSU112X power unit (see text).
7. Both UHF preamp and IR 'eye' power outputs have fold-back short-circuit protection, but not overload protection. It is the installer's responsibility to ensure that the stated current ratings are not exceeded.

Certain features of this amplifier are the subject of UK patent application GB 2425443.

2-Year Guarantee

This guarantee covers failure of your Proception product resulting from a manufacturing defect within a period of two years from the date of supply to the end-user.

This guarantee does not cover damage to the product cause by abuse, tampering, defective installation or natural causes such as lightening discharge. Repair or attempted repair, other than by the manufacturer, will render this guarantee void.

This guarantee does not affect a consumer's statutory rights.

Performance data given are typical unless otherwise stated. Proception Limited reserves the right to change product designs and specifications without prior notice.

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PROception

proAMP310X
Dual-mode 3-band
10-way Amplifier

INSTALLATION INSTRUCTIONS

This versatile product is an addition to the PROception range of multi-way distribution amplifiers. The unit has two modes of operation, allowing it to be used either as a straightforward 10-way 'aerial amplifier' for off-air signal distribution, or as a 'return-path amplifier' with its UHF input fed from the second loop-through output (RF OUT-2) of a Sky* satellite receiver or PVR. In its return-path mode full support is provided for remote infrared receivers ('eyes'). The use of 'F' connectors makes the amplifier easy to install and helps to ensure good system screening.

Features

- Separate filtered inputs for the FM radio, DAB (Band III) and UHF TV frequency bands.
- Ten independent outputs.
- Dual-mode operation – plain signal distribution amplifier, or return-path amplifier.
- Flexible powering options – local or remote power supply location.
- Automatic mode selection with 2-colour LED mode and power indicator.
- Bandpass filters on VHF inputs. UHF input filtered below 470 MHz to reduce risk of interference from CB, private mobile radio, TETRA, etc.
- Line-power for preamplifier available at UHF input.
- Suitable for both digital and analogue applications, fully DTT-compatible.

Mode 1 – application guide

See Figs. 1 (a) & 1 (b). Mode 1 (green LED) is also known as 'aerial amplifier mode'. In Mode 1 the unit functions as a straightforward multi-way amplifier for distribution of off-air and/or locally generated RF signals around a building. The input signals will usually come directly from the corresponding aerials. Line-power (5 V) for a masthead or similar preamplifier is available at the UHF input in this mode.

Line-power for this amplifier (12 – 15 V DC) can be supplied via any of the ten outputs. Alternatively, if a mains supply is available near the amplifier, a suitable local AC/DC mains power adaptor may be used instead of line-powering.

In Mode 1 no power is passed to unpowered outputs and the return-path amplifier and remote control functions are completely disabled.

Fig. 1 (a) shows a typical Mode 1 application with power provided by a proPSU112X power unit connected in one of the output lines.

Fig. 1 (b) shows a similar installation to Fig. 1 (a), except that a proMHD11L masthead preamplifier is used to boost the UHF input signals and power is provided by an AC/DC power adaptor adjacent to the amplifier. This diagram also shows how one or more of the output lines can be split to provide additional outlet points.

* "Sky" and "Sky+" are registered trade marks of British Sky Broadcasting Group PLC.

†"Freeview" is a registered trade mark of DTV Services Ltd.

Fig. 1 (a) – example Mode 1 application with remote power unit.

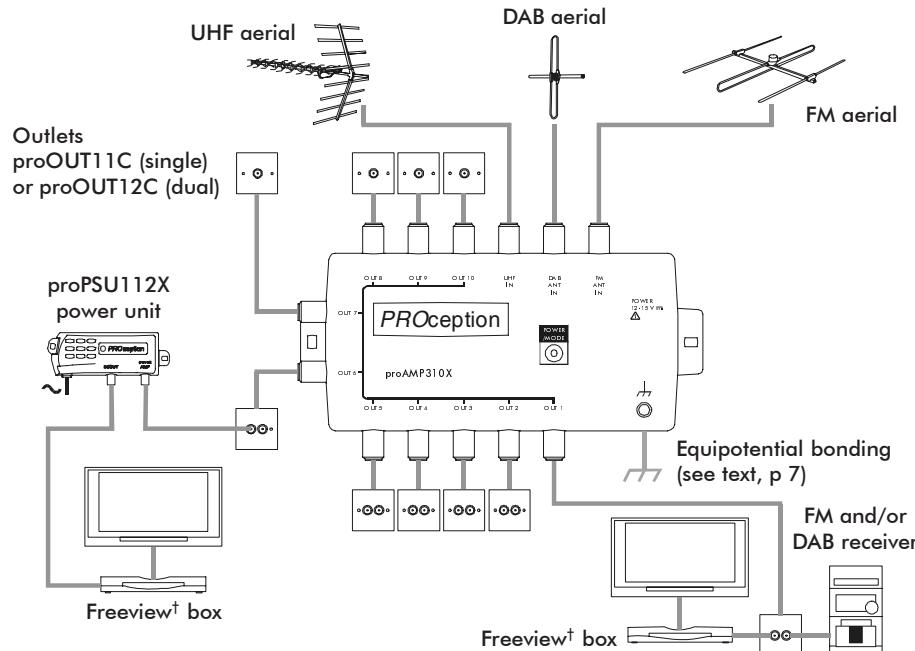
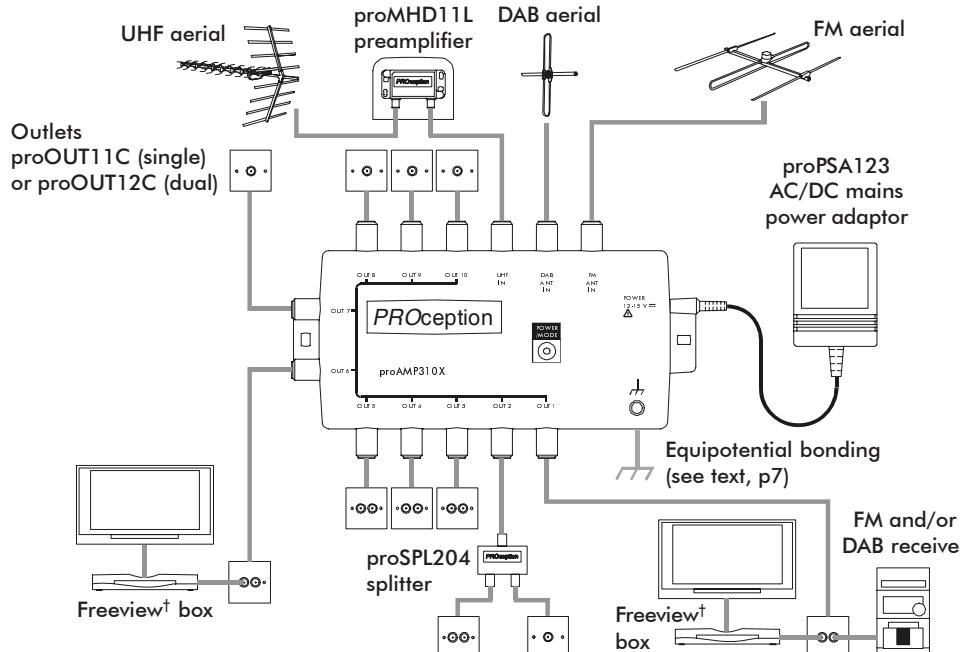


Fig. 1. (b) – example mode 1 application with local power unit and showing optional use of UHF preamplifier and output splitter.



Installation – signal connections

To preserve RF screening integrity the signal connections to the amplifier should be made using good quality coaxial cable and connectors. This is particularly important with DTT to minimise the ingress of impulsive electrical interference. The use of cable 'benchmarked' under the CAI scheme is recommended.

Crimp 'F' connectors, used in accordance with the manufacturer's instructions, will give the best results. The importance of achieving sound braid connections cannot be over-stressed. Connectors should be tightened with a spanner, not left finger-tight. Unused inputs and outputs of this amplifier do not need to be terminated.

Installation – mains power supply

Any fixed wiring installed to supply power for this amplifier should comply with BS 7671 (IEE wiring regulations) and, where relevant, Part P of the building regulations. Refer to the instructions provided with the power supply unit for other safety information.

Installation – system equipotential bonding

A bonding terminal is provided on the amplifier for use where necessary. Distribution systems supplying signals to more than one household should comply with the safety requirements of BS EN 60728-11. This effectively requires earthed equipotential bonding of the system. The use of isolated outlet plates is no longer recommended since they compromise screening integrity and allow ingress of interference.

Advanced configuration features

Note: access to the features described in this section involves opening the unit. The procedures below should only be carried out by a competent person, preferably under workshop conditions.

UHF input line-power (preamplifier power): where equipment (such as an attenuator) connected to the UHF input might be damaged by the presence of the 5 V output, or may cause the 30 mA current rating to be exceeded, the input line-power can be permanently disabled by removing the internal LINE-POWER jumper.

Forced Mode 2 operation: where Mode 2 operation is desired, but it is impracticable to connect a Sky receiver directly to the UHF input to provide a 9 V sense voltage, the unit can be 'forced' into Mode 2 by placing a jumper link on the 2-pin header labelled FORCE MODE 2. Since UHF input line-power will not usually be required in Mode 2, the existing LINE-POWER jumper can simply be moved to the FORCE MODE 2 header position. Forced Mode 2 operation is only relevant when a local power unit is in use, connected to the DC power port.

Access: to open the unit remove the four corner screws from the rear cover. Separate the two halves of the moulded cover and withdraw the screened amplifier assembly, together with the attached DC port connector. Remove the top metal lid – this is the side with the LED. One side of the PCB is now exposed. Take great care not to disturb any of the coils, as this could de-tune the input filters. The LINE-POWER jumper is located just above the LED; the Force MODE 2 jumper is in the bottom right-hand corner of the board, near the equipotential bonding terminal.

Re-assembly: when reassembling the unit take care to ensure that the LED does not become trapped and pushed inside the unit, and that the DC port connector is correctly seated in the cover mouldings before replacing the screws.

Mode 2 – 'eye count'

When using the remote powering option with the proPSU112X the total number of infrared 'eyes' on the system may need to be restricted. The proPSU112X is rated to supply a maximum of 200 mA, and approximately 120 mA is drawn by the amplifier itself. Thus the total 'eye load' is limited to 80 mA. This means that a maximum of eight 'industry-standard eyes' (each consuming about 10 mA) may be connected to the amplifier outputs. This restriction is removed if the PROception proSAT1EYE Mk 2 eye is used, since this consumes less than 5 mA.

Up to 10 eyes may be connected without restriction when using the proPSA123 AC/DC mains power adaptor.

Splitting outputs

As with any multi-way amplifier the output signals can be split as illustrated in Fig. 1 (b) to provide additional outlet points. The PROception proSPL204 splitter is suitable for this in Mode 1 and introduces approximately 4 dB insertion loss.

Splitting outputs in Mode 2 is not recommended, since it is not possible to provide individually protected eye power to the split outputs.

Signal levels

This amplifier has relatively low forward gain figures and assumes that adequate input signal levels will be available from properly installed aerials. The amplifier gains are sufficient to compensate for additional distribution cable losses in a typical domestic-scale system whilst avoiding the intermodulation and other overload problems which result from the use of excessive gain.

Recommended minimum and maximum signal levels for each of the frequency bands are given in the Technical data section on page 8. Particular attention should be paid to the input VHF radio signal levels. In city areas very strong signals are often received and it may be necessary to use attenuators on one or both of the VHF inputs to avoid overloading the amplifier.

Outlet plates

The use of outlet plates is recommended to provide a professional standard of finish to the distribution system. PROception screened outlet plates are recommended for use with this amplifier. The diplexed TV and radio plate (proOUT12C) allows both TV and radio equipment to be connected simultaneously to an outlet point. Single outlets (proOUT11C) may also be used and will allow either TV or radio equipment to be used. The system diagrams in Figs. 1 & 2 show both types of plate in use.

In Mode 2 a proOUT11C plate may also be used to provide the UHF return input connection from the Sky receiver, as illustrated in the diagrams in Fig. 2.

Installation – location and fixing

Choose a location for the amplifier which is dry and not subject to prolonged ambient temperature conditions of less than -10 °C or more than + 40 °C. Fix the unit to a sound vertical surface such as a wall or equipment mounting board. Ventilation gaps of at least 50 mm should be left around the front and all sides of the unit. More clearance will be required around sides where cables are connected.

Do not install the amplifier or its associated power unit where they may become smothered with curtains or other soft furnishing fabrics. When installing the amplifier and power unit in a roof space ensure that they will not come into contact with thermal insulation material.

Mode 1 – powering options

Power for operation in **Mode 1** can be supplied by either of the following options:

- a PROception proPSU112X 12 V power unit connected anywhere in any of the output lines – Fig. 1 (a);
- a local AC/DC mains power adaptor such as the PROception proPSA123 connected to the DC power port – Fig. 1 (b). The adaptor need not be regulated and needs to have a standard 2.1 mm DC connector with the correct polarity (centre pin +ve). If a 3rd party adaptor is to be used its output should conform to the requirements given in the technical data section (page 8).

Note: this amplifier is not suitable for powering from the aerial sockets of DVB-T (DTT or Freeview[†]) receivers. The voltage and current available from such receivers (usually 5 V at 30 mA) are insufficient.

Mode 1 – preamplifier option (preamplifier power)

Line-power for a masthead or similar preamplifier is available at the UHF input in Mode 1. The amplifier provides approximately 5 V with a current rating of 30 mA max., suitable for powering a PROception proMHD11L or proMHD11M preamplifier. If using other amplifiers take care to ensure that the current rating is not exceeded.

Use a preamplifier only when the UHF input signals would otherwise be too low in level – i.e. where the signal levels from the aerial are low, or where there is an unusually long cable run between the aerial and the proAMP310X amplifier. Always use the minimum amount of preamplifier gain necessary to obtain satisfactory signal levels at the amplifier input.

Preamplifier power is normally present at the UHF input, but will shut down if the aerial presents a short-circuit at the input. Note that this shut-down is not self-resetting. If preamplifier power is wanted, but has been shut-down by a temporary short circuit, it must be reset manually by removing power to the amplifier for a few seconds.

If necessary, preamplifier power can be permanently disabled by means of an internal jumper (see "Advanced configuration features" on page 7).

Mode 1 – additional UHF sources

Any additional UHF signal sources such as CCTV camera channels should be combined with the aerial signal feed ahead of the proAMP310X. This is best done using equipment providing a buffered loop-through arrangement (e.g. the PROception proMOD1 Mk 2 video and audio modulator) or by the use of suitable combining filters. The practice of using wideband combiners is discouraged since it can degrade signal-to-noise ratios and can cause locally generated signals to be radiated from the aerial, possibly causing interference to other viewers.

Note: where auxiliary equipment connected to the UHF input might be affected or damaged by the 5 V preamplifier power, the latter should be disabled using the jumper facility mentioned in the previous section.

Fig. 2 (a) – example Mode 2 application with remote power unit.

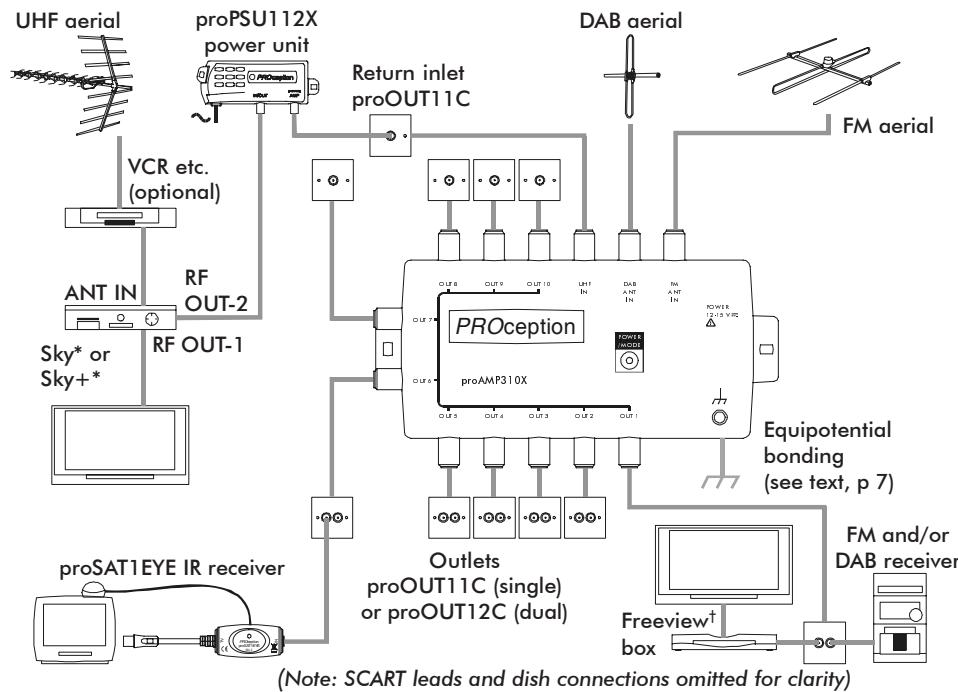
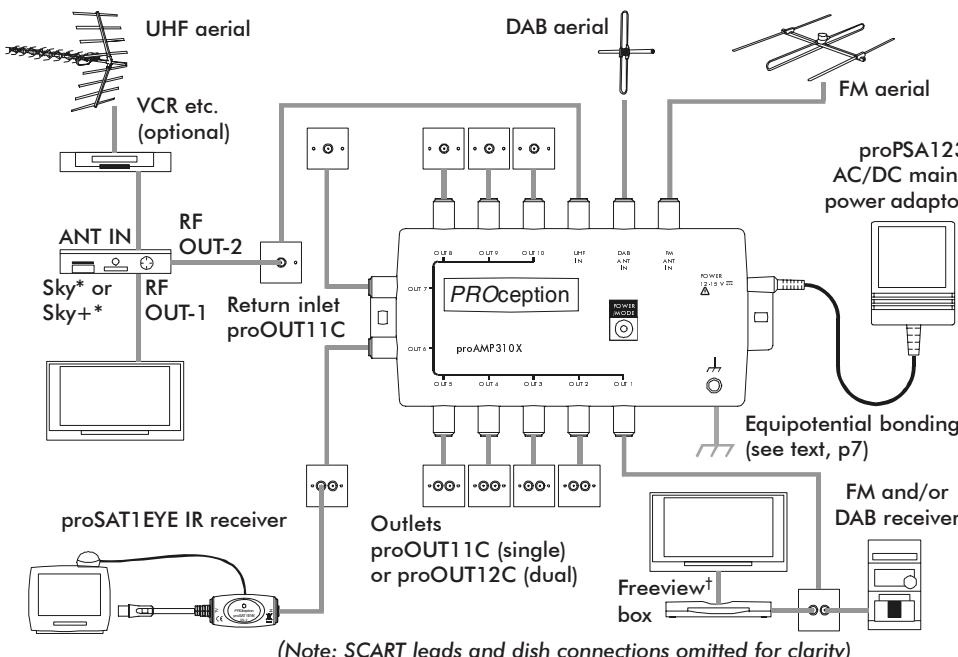


Fig. 2 (b) – example Mode 2 application with local power unit.



Mode 2 – application guide

See Figs. 2 (a) & 2 (b). Mode 2 (orange LED) is also known as 'return-path mode'.

In **Mode 2** the unit functions as a 'return-path amplifier'. This mode is appropriate where the UHF input to the amplifier is provided from the second loop-through output (RF OUT-2) of a Sky satellite receiver or PVR. A return RF path is enabled in the proAMP310X, allowing remote infrared receiver 'eyes' such as the PROception proSAT1EYE Mk 2 to communicate with the Sky box. This provides remote control extension so that the Sky receiver can be controlled from a remote viewing location.

Mode 2 is automatically enabled when the amplifier detects the presence of 9 V (or higher) DC at its UHF input (see the following section for further details). In this mode the LED indicator changes from green to orange and a voltage (approx. 9 V DC) is present at each output for powering a remote infrared receiver. Infrared receiver power is individually short-circuit protected, so that a DC short at any output will not affect operation of remote control via other outputs.

Fig. 2 (a) shows a typical Mode 2 application with power provided by a proPSU112X power unit connected in the UHF return feed from the Sky receiver.

Fig. 2 (b) shows a similar installation to Fig. 2 (a), except that power is provided by an AC/DC mains power adaptor adjacent to the amplifier.

Mode 2 – powering options

Power and sensing voltages for operation in Mode 2 can be supplied by either of the following options:

- a PROception proPSU112X 12 V power unit connected anywhere in the UHF return feed (i.e. in the line between RF OUT-2 of the Sky receiver and the amplifier's UHF input) – Fig. 2 (a);
- a local AC/DC mains power adaptor such as the PROception proPSA123 connected to the DC power port – Fig. 2 (b). The adaptor need not be regulated and needs to have a standard 2.1 mm DC connector with the correct polarity (centre pin +ve). If a 3rd party adaptor is to be used its output should conform to the requirements given in the technical data section (page 8). When using this option the UHF input must be directly connected to the Sky receiver RF OUT-2 since the 9 V 'second outlet power' needs to be sensed at the UHF input to switch the amplifier to Mode 2. The current drawn from the Sky receiver in this configuration is very small (typically 3 – 5 mA).

The Sky receiver should be configured in its **INSTALLER SET-UP** menu to provide power on RF OUT-2. On the Sky handset press **SERVICES, 4, 0, 1, SELECT**, then select the **SECOND OUTLET POWER SUPPLY** option. Set this to be **ON** (the default state is **OFF**), **SAVE SETTINGS** and **BACK UP** out of the menu.

Interlock function: if a connector is present in the amplifier's local DC power port then power will not be accepted via the UHF input, regardless of whether the AC/DC mains power adaptor is actually providing power. This is an interlock function which prevents the Sky receiver trying to power the entire distribution system in the event of failure of, or loss or power to, the local power adaptor.

Important note: this amplifier is not suitable for powering directly from a Sky receiver. The configuration where the Sky receiver's RF OUT-2 is directly connected to the amplifier's UHF input without a local mains power adaptor present is not permitted.