

The starBOX distribution hubs allow the installation of a modern house-wide radio and television distribution system. Using a simple radial star-wiring concept, the starBOX system can distribute all the usual off-air analogue and digital broadcast signals to up to eleven outlets around the home: one master outlet plus up to ten extension rooms.

In addition, the output channels from set-top equipment such as satellite and digital receiver boxes, PVRs, DVD players or recorders and VCRs at the master location are made available in all extension rooms. Compatibility with remote control extender systems allows such equipment to be controlled from one or more extension rooms using readily available accessories.

A CCTV door or security camera (or similar auxiliary TV source) can also be connected to the system and can be viewed on any connected TV set.

Our starBOX distribution hubs are compliant with the Radio Equipment Directive 2014/53/EU and meet the harmonised standard EN 303 354 for Class 0. As such they work on ALL current UK DTT channels including channel 60, are resilient to interference and overloading, and cope with multiple carriers. In cases of strong LTE interference a separate 4G filter should be fitted. These are supplied free by at800, or *higher performance models* can be purchased from www.blake-uk.com. (To *pass* channels *up to and including channel 59* use PROLTE1/59, or *if channels 58 and 59 are not required, use PROLTE1/57*).

Principles

Sources and inputs:

Separate input connectors on the PROSTR5S and PROSTR10S starBOXes allow connection of the following sources:

- **FM ANT** (87.5 to 108 MHz) for VHF/FM radio from a suitable FM aerial.
- **DAB ANT** (217.5 to 230 MHz) for Band III DAB digital radio from a suitable aerial, such as a vertical half-wave dipole.
- **UHF ANT** (470 to 854 MHz) for analogue or digital TV from the main aerial. This input is powered at approx. 8 V DC, allowing the use of a PROception PROMHD11L masthead preamplifier where necessary in weak signal areas, or where the aerial downlead is unusually long. Amplifiers are not fitted with 4G filtration. If necessary a separate 4G filter should be fitted. These are supplied free by at800 or can be purchased from www.blake-uk.com.
- **CCTV (UHF)** this is a second, lower-gain, UHF input and allows connection of an auxiliary source such as a camera. The input must be a modulated UHF signal: sources which provide baseband audio and video (CVBS) must be connected via a separate UHF modulator. Use our UHF AV modulator (PROMOD1) to modulate the UHF signal.
- **LNB 1** a satellite (IF) input for the first (or only) feed from a satellite dish.
- **LNB 2** provided for use when a second satellite feed is required, e.g. for a twin-tuner PVR, such as Sky+*.
- **UHF RETURN** this input normally accepts the return feed from the equipment at the master location. This should come from the last item in the UHF loop- through path, carrying the off-air and CCTV UHF signals together with any set-top equipment modulator outputs. The return feed provides the UHF signal for distribution to the extension room outputs. Remote control from the extension room outlets also operate via this input.

Outputs:

- **MASTER OUT**—this output carries the off-air FM, DAB and UHF aerial signals as well as the CCTV feed and satellite signals from LNB 1 IN. All signals are combined in high-grade frequency-selective combiners to ensure minimal interaction. MASTER OUT is usually connected to a master outlet plate at the master location (i.e. the location of the main TV and set-top equipment).

- **LNB 2 OUT**—this is a filtered through-connection from LNB 2 IN and, where used, will usually connect to a second SAT outlet at the master location. High-pass filtering is included in the starBOX to prevent terrestrial signals being degraded by LNB noise which could otherwise interfere due to crosstalk in the wiring or the master outlet plate.
- **OUT 1-5 or OUT 1-10**—these are the extension room outlets and carry FM and DAB radio from the respective aerial inputs as well as the UHF return signal connected to UHF RETURN. These outputs do not carry satellite IF signals. Each of the five or ten outputs is powered at approximately 9 V DC to power an infrared receiver eye.

Important: please understand that the UHF path to the extension room outlets comes entirely from UHF RETURN IN. There is no direct bypass from the aerial and CCTV inputs to the extension rooms. Therefore there must **always be a path or connection between MASTER OUT and UHF RETURN**, otherwise no TV signals will reach the extension rooms. This path is usually provided at the master location, as explained above. In the event that **no master equipment is installed, a link should be connected between MASTER OUT and UHF RETURN** either at the master outlet plate or directly at the starBOX unit in order to provide TV signals in the extension rooms.

Remote control option:

Using a magic infra-red eye (e.g. PROception PROSAT1EYE) enables remote control. However, this can only be used to control a Sky Digibox or Sky+ PVR. The remote receiver eyes communicate directly with the Sky* equipment and it is essential that the UHF RETURN input of the starBOX is fed directly from the RF OUT-2 connector of the Sky* or Sky+* receiver (see connection diagram, Fig.2) or I/O port[#] of the Sky receiver.

[#] I/O Port Replicator needed for Sky box DXR850/890; See Supplementary Installation Instructions to introduce PROception PROLINK22 'RF replicator'.

Installation notes

Installation fixed wiring plan:

The fixed wiring for a full installation is shown in Fig.1 on pages 6-7. Signal sources not required may of course be omitted. Any number of extension rooms may be connected, up to the maximum of five or ten for the PROSTR5S and PROSTR10S units respectively. The diagram also shows how the two spare outputs from a quad LNB can be wired to single F outlets in an extension room/s to allow additional local satellite equipment to be used. In this case a separate Sky* or Sky+* receiver will be needed at this location.

starBOX location and fixing:

Choose a suitable central location to fix the starBOX unit. The location must be dry and not subject to prolonged ambient temperature conditions of less than -10 °C or more than +40 °C.

Fix the starBOX 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 above, below and to the left of the unit to allow access for the signal cables.

Do not install the unit where it could become smothered with curtains or other soft furnishing fabrics or leave it resting on a carpet. When installing the unit in a roof space or similar building void ensure that it will not come into contact with thermal insulation material.

Cables and signal connections:

To preserve RF screening integrity the signal connections to the unit should be made using good quality coaxial cable and connectors. This is particularly important with digital terrestrial TV (DTT) to minimise the ingress of impulsive electrical interference from home appliances and with digital satellite TV to prevent missing channels. The use of cable benchmarked under the CAI scheme is recommended. All signal connections are made with Type-F connectors. The use of good quality crimp 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. Completed connections should always be tightened with a spanner; leaving them finger-tight can sometimes lead to poor connections and attenuation of the signal. If the CCTV input is not used, the 75Ω terminator plug supplied must be left in place. Any other unused connectors may be left open.

Mains supply connection and safety notes:

The starBOX is supplied with a fitted mains plug and may be plugged directly into a 13 A (BS 1363) socket outlet. If socket outlets of a different type are in use, please refer to the safety instructions on page 11. The mains plug should remain readily accessible to permit disconnection of the unit from the supply.

Alternatively the plug may be cut off and the amplifier wired into a readily accessible fused connection unit, fitted with an approved 3 A fuse to BS 1362. This method of connection is recommended for permanent distribution system applications, since it reduces the risk of tampering and accidental disconnection.

If the unit is not connected to the mains using the fused plug supplied, or a fused connection unit, it must be protected by means of a fuse or MCB at the final distribution board of rating not exceeding 6 A. A readily accessible local isolating switch should be provided to allow the unit to be disconnected from the supply when necessary. Any fixed wiring installed to supply power to this starBOX should comply with BS 7671 (IEE wiring regulations) and, where relevant, Part P of the building regulations. StarBOXs are of Class 2 construction and do not require a protective earth connection. This does not obviate the need to provide a circuit protective (earth) conductor in the supply wiring, as required by BS 7671.

System equipotential bonding:

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. (Isolated outlet plates cannot be used with starBOX units for functional reasons.) Although not mandatory in single households, the use of system earth bonding is strongly recommended for all installations. All starBOXs are provided with an earth terminal. A bonding conductor of 4 mm² should be provided, connected to the main earth terminal of the electrical installation which supplies the unit. Bonding may be affected by using earth bonding bars.

User's equipment connections

Master location:

Figs.1 and 2 show typical wiring diagrams for the user's equipment at the master location. Some points to note are:

- When using Sky*-only remote control from the extension rooms, the RETURN connection to the master outlet plate must come directly from RF OUT-2 of the Sky receiver (Fig. 2). RF OUT-1 should be connected to the local main TV. The starBOX provides 9 V DC power for remote receiver eyes on all extension room outputs. Note that some Sky receivers require their RF OUT-2 power option to be enabled in order for remote control extension to work. On the Sky handset press SERVICES, 4, 0, 1, SELECT, then select the SECOND OUTLET POWER SUPPLY option. Set this to be ON, SAVE SETTINGS and BACK UP out of the menu.
- TV signals (UHF) will only be available in the extension rooms if a feed is provided to the UHF RETURN connection (see explanation above in the Principles section). If no remote control extender system is to be used, a two-way passive splitter should be employed if necessary to split the RF output from the final item in the UHF loop-through chain, with one leg of the splitter connected to the main TV and the other leg feeding UHF RETURN.
- If no equipment is in use at the master location connect a short lead between the TV and RETURN connectors at the master outlet (or between MASTER OUT and UHF RETURN at the starBOX itself) to provide TV signals in the extension rooms.

Extension rooms:

Fig.3 shows a typical extension room installation with an infrared receiver eye. Points to note when using remote control extension are:

- Any signal outlet plate used must be non-isolated and must provide DC continuity to the TV outlet to enable power from the starBOX to reach the receiver eye.

- The coupler part of the receiver eye must be connected the right way round: with the male coax connector facing the TV and the incoming signal connected to the female port. Remote control functions will not work if the coupler is connected the wrong way round.
- Ensure that all wiring between the starBOX and the coupler provides reliable DC continuity. The most common cause of remote control problems is poor connections in the extension rooms, resulting in loss of power to the IR receiver eyes.

Tuning:

To view output programmes from master location set-top equipment, the extension room TVs must be tuned-in to the output channel(s) of the equipment concerned. To tune-in these TVs leave a tape or disk playing on a VCR/DVD player or select a known channel on a digital receiver, then tune an unused channel setting on each of the remote TVs into the video or digital programme. For instructions on how to tune a TV refer to its instruction manual or the manufacturer's help line or website. Similar tuning will be required for the CCTV camera output, where installed.

Where more than one item of set-top equipment is connected in the system you may experience severe interference (patterning) when more than one output channel is present. In this case the output channel number (modulator channel) for one or more items will need to be changed and the relevant TV(s) returned. If further set-top equipment is to be used in an extension room it should be connected between the eye coupler and the TV. The output channel from such equipment will only be available in that extension room. To use a satellite receiver in an extension room a separately-wired feed from a dish/LNB is required, as shown in *Fig.1*. This option can be of interest where a Sky+*PVR is in use at the master location and an older Digibox has been retained for use in another room.

Fig.1—Full installation fixed wiring.

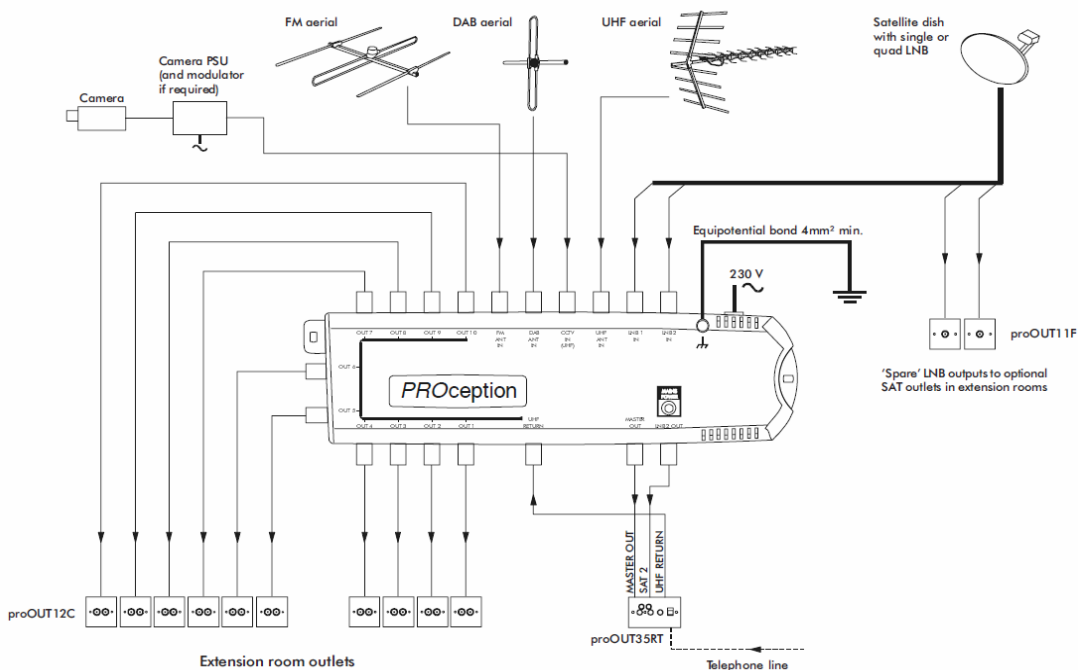


Fig.2—Main viewing location wiring diagram for Sky-only remote control.

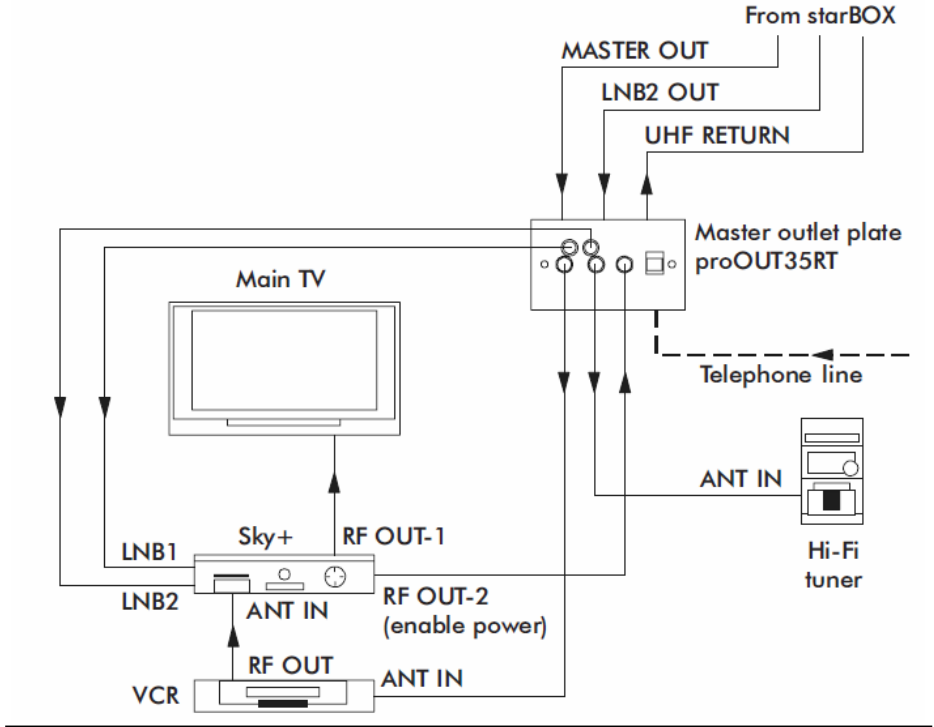
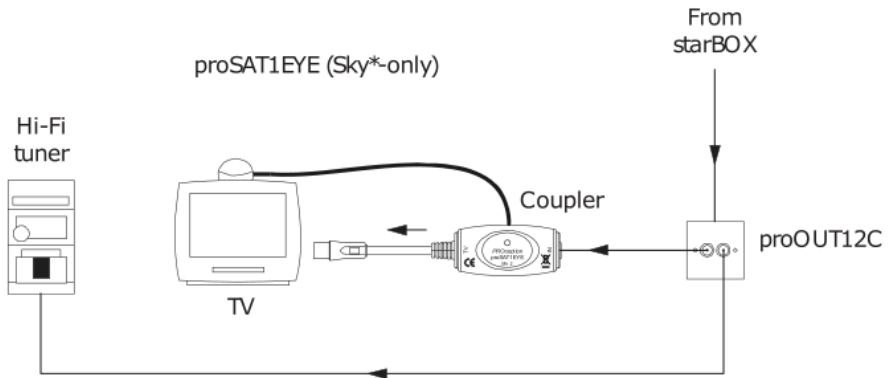


Fig.3—Extension room installation with remote control.



Note: SCART and telephone connections have been omitted from these diagrams for clarity.

Technical data

PROSTR5S, PROSTR10S - Solo starBOX					
Antenna inputs	FM ANT IN	DAB ANT IN	CCTV IN (UHF) ¹	UHF ANT IN	LNB 1 IN
Signal frequency ranges	87.5 .. 108MHz	217.5 .. 230MHz	470 .. 862MHz	470 .. 862MHz	950 .. 2150MHz
Gain or loss to MASTER OUT	8dB gain	8dB gain	8dB loss	13dB gain	2dB loss
VHF bypass to distribution outputs	2dB gain	2dB gain	-	-	-
Max. recommended input level ²	66dB μ V	60dB μ V	-(passive)	76dB μ V	-(passive)
Input filter rejection	-	-	-	≥ 26 dB ³	≥ 43 dB ⁴
Line power for UHF preamplifier ⁵	-	-	-	8V at ≤ 25 mA	-
LNB 2 input					
Insertion loss to LNB 2 OUT	2dB (950 .. 2150MHz)				
Filter rejection	≥ 23 dB ⁴				
Line power pass	20V DC at 250mA max. (also applies to MASTER OUT to LNB 1 IN)				
Distribution section					
Signal frequency range (UHF)	470 .. 862MHz (via UHF RETURN IN)				
Number of distribution outputs	5 (PROSTR5S) or 10 (PROSTR10S)				
Gain to distribution outputs	4dB				
Max. recommended input level	75dB μ V				
RF return path frequency range	5-10MHz (gain approx. 2dB from each distribution o/p to UHF RETURN IN)				
Remote control compatibility	PROSAT1EYE (IR control eye 'magic eye')				
IR receiver (eye) line power	9V DC at 15mA present at all distribution outputs				
General					
Mains power requirement	230V 50Hz at 8W (10VA)				
Signal connector type	F' (IEC 60169-24)				
Operating temperature range	-10 .. +40°C				
Standards compliance	Safety: BS EN 60065 : 2002; EMC: BS EN 50083-2 : 2001 - equipotential bonding terminal provided				

Notes:

1. CCTV IN is an auxiliary UHF input and can be used for any UHF (modulated) signal source. This input should always be terminated in 75 Ω if no used (a suitable termination is supplied with each unit).
2. Maximum UHF signal levels are given for 5 analogue TV channels plus up to 6 DTT multiplexes at ≤ -14 dB relative level (FM RADIO SIGNALS SHOULD NOT EXCEED -10 dB relative to analogue TV).
3. For all frequencies ≤ 400 MHz (TETRA filtering).
4. For all frequencies ≤ 854 MHz (LNB wideband noise filtering).
5. Recommended preamplifier is PROception type PROMHD11L (use only in weak signal areas or where there is a long cable run from the UHF antenna).

* Sky and Sky+ are registered trademarks of British Sky Broadcasting Group PLC.

Freeview is a registered trademark of DTV Services Ltd.

Safety Instructions

Overheating:

These amplifiers are intended for use in moderate climates only. They should not be used in tropical regions. The recommended ventilation clearances and other precautions given in the relevant section of this instruction leaflet should be observed to prevent overheating. No unit should be fixed where it is likely to become smothered by soft furnishing fabrics such as curtains, or by thermal insulation material in a roof space or building void. Mains powered equipment should not be left resting on a carpet

Water and fire risks:

The appliance is not waterproof. It is intended for indoor use only and must not be fixed where it could be exposed to dripping or splashing water. Objects containing liquids should not be placed on or near the appliance. To prevent risk of fire, no object with a naked flame should be placed on or near the appliance, or its associated wiring.

Mains plug and disconnection from the supply:

The appliance is supplied with a standard fused plug fitted. If this is unsuitable, refer to the instructions below. If you need to change the fuse in the fitted plug, a 3 Amp fuse to BS 1362 carrying the ASTA or BSI approval mark must be used. Always replace the plastic fuse carrier when renewing the fuse. The plug (or other means of disconnection from the supply, if used) should remain readily accessible for operation when necessary. The LED power indicator on this equipment should not be regarded as providing reliable indication of supply disconnection.

Changing the plug:

If the fitted mains plug is not suitable for the socket-outlets in use, it should be cut off and a new plug fitted...

Wiring the new plug: Instructions supplied with the new plug should be followed. The brown wire must be connected to the live (L) terminal of the plug and the blue wire to the neutral (N) terminal. Neither wire should be connected to the earth (E) terminal of a 3-pin plug (the appliance does not require an earth connection). Ensure that the cord grip in the plug is correctly used and clamps the sheath of the cord firmly.

Fuse Rating: If the new plug is a fused type, the fuse fitted should be rated at not more than 3 Amp.

Caution: The old plug should be destroyed immediately since it would be dangerous if plugged into a live socket.

Related Products:

Link to Website:

Distribution Amplifiers: 4, 6 & 8-Way FM/DAB/UHF Distribution Amplifiers	www.blake-uk.com/proamp24-28
PROSAT1EYE: IR Control Eye 'Magic Eye	www.blake-uk.com/eye
PROLINK22: Flexible 'I/O Link' RF Modulator for Sky	www.blake-uk.com/prolink22
PROCON01: F Male Twist-On +O-Ring - RG6/100	www.blake-uk.com/procon01
PROCON02: F Male Twist-On +O-Ring Black - RG6/100	www.blake-uk.com/procon02
PROCON12: F Male Crimp-On Black - RG6/100	www.blake-uk.com/procon12
PROCON22: F Male Snap Seal / Compression - RG6/100	www.blake-uk.com/procon22

Other Ranges of Products & Services from Blake UK, PROception & CappSure...

- TV, Wi-Fi & 4G Aerials www.blake-uk.com/aerials
- Brackets & Installation Equipment www.blake-uk.com/bracketspoles
- AV TV Wall Mounts www.blake-uk.com/tvbrackets
- CappSure Wi-Fi IP Cameras www.blake-uk.com/cappsure
- Coaxial Connectors & Adaptors www.blake-uk.com/procon
- RF Signal Distribution www.blake-uk.com/rfsignal
- HDMI Signal Distribution www.blake-uk.com/hdmi
- LTE Filtering Products www.blake-uk.com/lte
- Satellite Mounts www.blake-uk.com/satmount
- Bespoke Manufacturing www.blake-uk.com/bespoke
- UK R&D www.blake-uk.com/researchdevelop

EU Declaration of Conformity

Blake UK hereby declares that the radio equipment type PROSTR5S and PROSTR10S are in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.blake-uk.com/DoC

2 Year Guarantee

This guarantee covers failure of your PROception product resulting from manufacturing defect within a period of 2 years from the date of supply to the end-user. This guarantee does not cover damage to the product caused by abuse, tampering, defective installation or natural causes such as lightning 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. We reserve the right to change product designs and specifications without prior notice.

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