

## INSTALLATION AND USER INSTRUCTIONS

This starBOX hub allows the installation of a modern radio and television distribution system. Using a simple radial star-wiring concept, the starBOX system can distribute analogue and digital broadcast signals to up to six outlets around the home – a master outlet, plus up to five extension rooms. This 'MDU' version of the starBOX is intended for use where the broadcast signals are supplied from a shared-aerial and dish system in 'multiple dwelling unit' installations (e.g. in flats) rather than for individual stand-alone home installations with their own aerials.

In addition to distribution of incoming signals, 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.

An individual CCTV door or security camera (or similar auxiliary TV source) can also be connected to the local system and can be viewed on any connected TV set (this is in addition to any common CCTV channel which may be supplied to all housing units by the feeding system).

### Principles

This section provides a brief technical overview of the starBOX system.

#### Inputs

The proSTR5M starBOX is for use in conjunction with an aerial and dish-sharing system using satellite multiswitches. The following inputs are provided:

- **IRS 1** – this is the main input from the feeding distribution system. This feed will usually come from the output of a multiswitch in an integrated reception system (IRS) carrying FM radio (Band II), DAB digital radio (Band III), UHF analogue and digital TV (Bands IV & V) and a switchable satellite IF feed.
- **IRS 2** – this input is provided for use when a second satellite feed is required, e.g. for a twin-tuner PVR, such as Sky+\*. Where this input is used a second IRS feed from a separate multiswitch output will be required. (It is not possible to 'split' a single multiswitch output since the second satellite feed must be independently switchable for frequency band and polarisation.)
- **CCTV (UHF)** – this is a separate local 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.

### 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. Proception Limited reserves the right to change product designs and specifications without prior notice.

**Proception Limited,**  
177-187 Rutland Road  
SHEFFIELD  
S3 9PT  
United Kingdom

Web: <http://www.proception.co.uk/>  
e-mail: [support@proception.co.uk](mailto:support@proception.co.uk)



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- **UHF RETURN** – this input normally accepts a return feed from the equipment at the master location. This should come from the last item in the UHF loop-through path and will thus carry the input UHF signals from IRS 1 IN, 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 operates via this input.

**Note:** for individual stand-alone home installations where the FM, DAB, UHF and SAT signals are provided by dedicated aerials and an LNB, use the proSTR5S or proSTR10S starBOX instead of the 'M' version. The 'S' (solo) versions have separate aerial inputs for this application.

### Outputs

- **MASTER OUT** – this output carries the FM, DAB, UHF and satellite signals from IRS 1 IN, as well as the local CCTV feed. 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 straight-through connection from IRS 2 IN and, where used, will usually connect to a second SAT outlet at the master location.
- **OUT 1 to OUT 5** – these are the extension room outlets and carry FM and DAB radio from the IRS 1 input as well as the UHF return signal connected to UHF RETURN. These outputs do not carry satellite IF signals. Each of the five outputs is powered at approx. 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 IRS 1 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 options

StarBOXes are compatible with two different remote control extender systems. These are:

- the Sky\* type (e.g. PROception proSAT1EYE) which can only be used to control a Sky Digibox or Sky+ PVR. With this type 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).
- PROception starLINK. This is a near-universal remote control extender system which employs a *base unit* and *emitters* or an infrared *blaster* at the master location. This type can control a wide range of equipment, including Sky\* receivers, most Freeview<sup>†</sup> boxes, VCRs, etc. (NB starLINK is not compatible with UK digital cable boxes or B&O Beolink equipment.)

Use of the two remote control systems cannot be mixed within one installation.

## Safety Instructions

### OVERHEATING

The starBOX is intended for use in moderate climates only. It 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.

## Technical data

proSTR5M – MDU starBOX					
IRS 1 & CCTV inputs	IRS 1 IN				CCTV IN (UHF) <sup>1</sup>
	FM band	DAB band	UHF band	SAT IF band	
Signal frequency ranges	87.5 .. 108 MHz	217.5 .. 230 MHz	470 .. 862 MHz	950 .. 2150 MHz	470 .. 862 MHz
Gain or loss to MASTER OUT	2 dB gain	2 dB gain	2 dB loss	2 dB loss	3 dB loss
VHF bypass to distribution outputs	2 dB gain	2 dB gain	–	–	–
Max. recommended input level <sup>2</sup>	66 dB $\mu$ V	60 dB $\mu$ V	– (passive)	– (passive)	76 dB $\mu$ V
<b>IRS 2 input (DC .. 2150 MHz)</b>					
Insertion loss to LNB 2 OUT	≤ 2 dB				
Line power pass	20 V DC at 250 mA max. (also applies to MASTER OUT to IRS 1 IN)				
<b>Distribution section</b>					
Signal frequency range (UHF)	470 .. 862 MHz (via UHF RETURN IN)				
Number of distribution outputs	5				
Gain to distribution outputs	5 dB				
Max. recommended input level <sup>2</sup>	75 dB $\mu$ V				
RF return path frequency range	5 .. 10 MHz (gain approx. 2 dB from each distribution o/p to UHF RETURN IN)				
Remote control compatibility	proSAT1 EYE (Sky* only) or PROception starLINK system ('universal')				
IR receiver (eye) line power	9 V DC at 15 mA present at all distribution outputs				
<b>General</b>					
Mains power requirement	230 V 50 Hz at 7 W (9 VA)				
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  $\Omega$  if not 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).

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

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

## Installation notes

### Installation fixed wiring plan

The fixed wiring for a full installation is shown in Fig. 1. Use of the IRS 2 and CCTV inputs is optional; these can be left unconnected if the corresponding facilities are not required. Any number of extension rooms may be connected, up to the maximum of five.

### 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 75  $\Omega$  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. StarBOXes 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 starBOXes are provided with an earth terminal. A bonding conductor of 4 mm<sup>2</sup> should be provided, connected to the main earth terminal of the electrical installation which supplies the unit. Bonding may be effected using PROception proBAR5 or proBAR8 equipotential bonding bars.

### User's equipment connections

#### Master location

Figs. 2, 3 and 4 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.
- When using the starLINK remote control system the UHF RETURN connection must be fed from the LINE OUT connector of the proSTL1BASE base unit. The starLINK system may be used with a wide variety of equipment, including Sky\* and Freeview† receiver boxes, most VCRs, DVD players, etc. (Figs. 3 & 4). Full installation instructions for the starLINK system are contained in the instructions supplied with the proSTL1KIT product.
- 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.

Fig.4 - Main viewing location wiring diagram for Freeview with starLINK remote control.

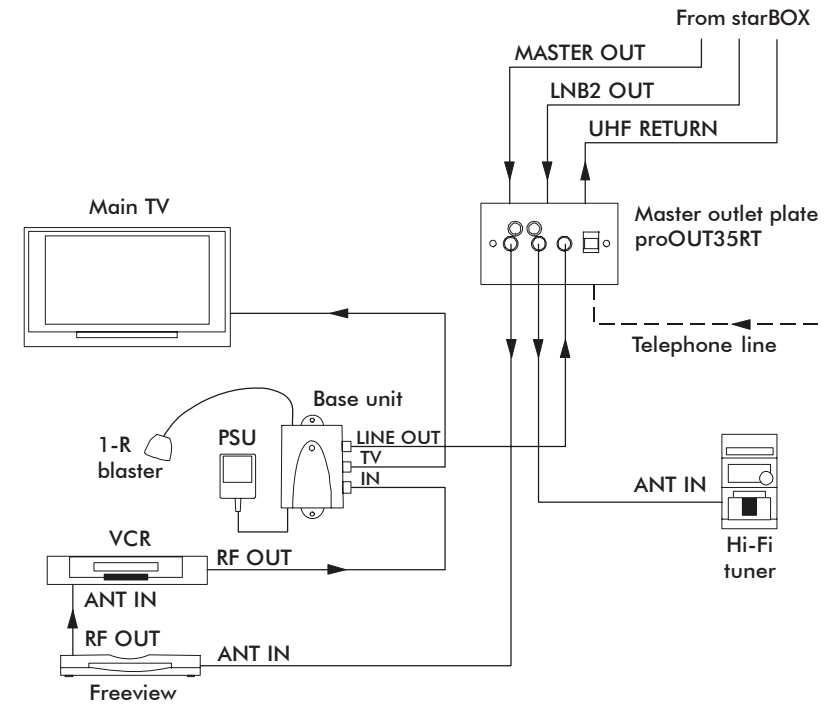
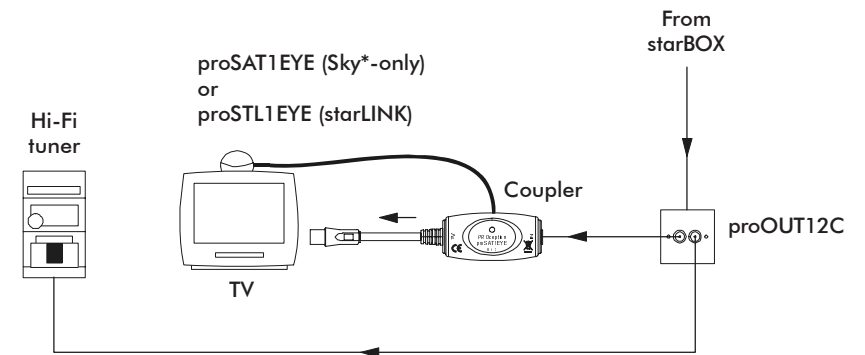


Fig.5 - Extension room installation with remote control.



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

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

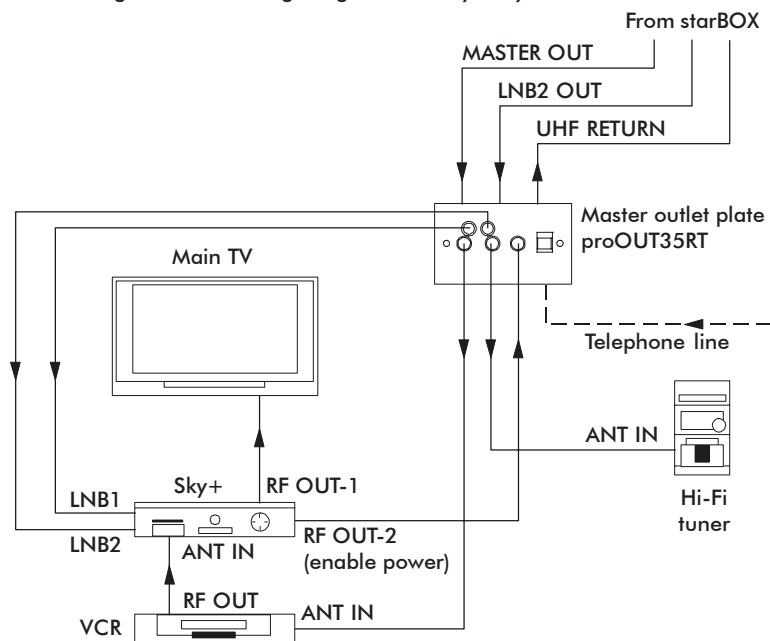
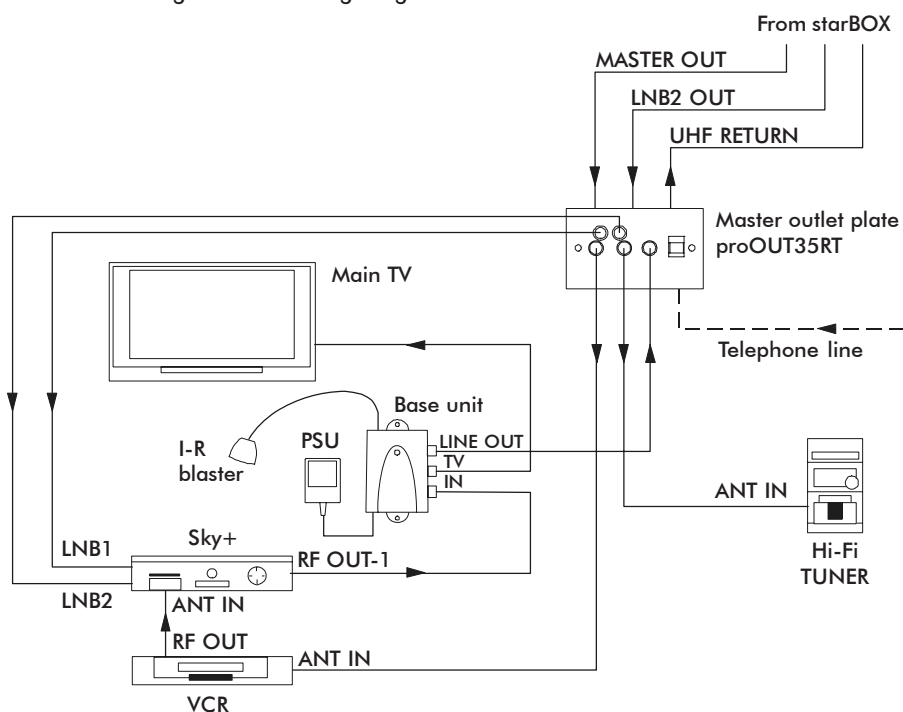


Fig.3 - Main viewing location wiring diagram for starLINK remote control.



- 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. 5 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 – that is 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 or 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 Web site. 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) retuned. 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.

Fig.1 - Full installation fixed wiring.

