

A man in a dark shirt is shown in profile, looking down at a computer monitor. His hands are resting on a desk. In the background, other people are blurred, suggesting an office environment. The overall lighting is soft and professional.

HellermannTyton

# Home Network Sciences

designer's guide

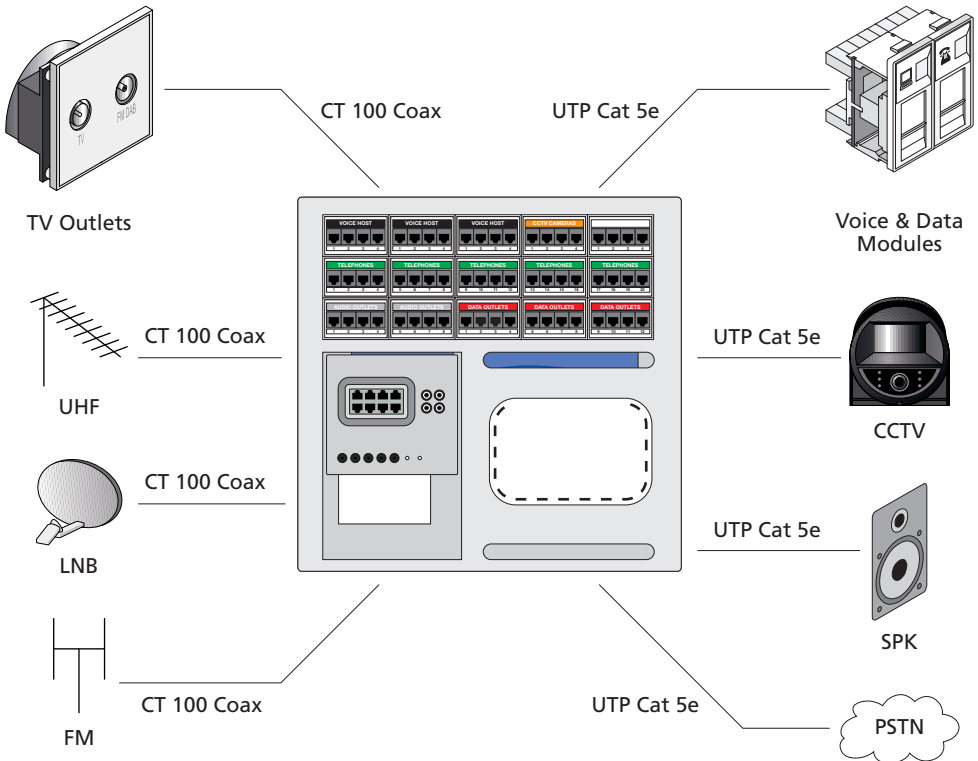
# About Home Network Sciences

Home Network Sciences provides a networking infrastructure to support communications and entertainment now and into the future. The benefit to owners is that multimedia content can be delivered to any room in their property. The system is suitable for installation into apartments, houses and small business premises.

Successful implementation is dependant on the designer having a thorough understanding of the system. This document gives designers an explanation of the system and its component parts. Examples are given for the specification of a two bedroom apartment and a four bedroom family home.

## System Overview

The system is based on a Star wired structured cabling system.



Full size chassis shown

# Modular Outlets

Modular Outlets are used to present the multimedia services around the property. The modules are designed to fit into “easy-clip” style faceplates. The faceplates are available in a number of decorative finishes to match electrical accessory plates. Finishes include, white, brass, stainless steel and bright chrome. The figure in brackets represents the number of modules that will fit in a standard single and dual gang UK faceplate respectively.

There are three types of Outlets Modules; Telephone, Data and TV:

## **Telephone Modules (2s/4d) i.e. 2 per single gang plate, 4 per dual gang plate**

This is the same socket used for domestic telephone extensions throughout the UK. The designer should plan to locate a telephone module at any location where telephony equipment may be required. One Category 5e cable should be run from each telephone module back to the central chassis location. Telephone modules are designated with a telephone icon.

## **Data Modules (2s/4d)**

These are also known as RJ 45's and are used for the connection of most data services.

The designer should consider where the user may wish to position data equipment both immediately (Home Networking) and in the future. (Video Terminals and “Internet Ready” Appliances). One Category 5e cable should be run from each data module back to the central chassis location. Data Modules are designated with a computer icon.

In general it is prudent to allow for at least one data module in every room.

## **TV Modules**

These are used to connect Televisions, Freeview Boxes, Video Recorders and FM/DAB receivers to the system around the property.

There are four types of TV outlets:

**Simplex Modules (2s/4d)** are used to connect a TV/VCR or an FM/DAB receiver to the system

**Diplex Modules (1s/2d)** are used to connect a TV/VCR and a FM/DAB receiver simultaneously

**Triplex Modules (1s/2d)** are used to connect a TV/VCR, an FM/DAB receiver & a Satellite decoder to the system.

**Quad Modules (1s/2d)** are used to connect a TV/VCR, an FM/DAB receiver and two Satellite feeds.

The designer should allow a simplex or diplex module at any location where the user is likely to use a TV or FM/DAB receiver. A CT100 or equivalent cable should be run from each TV module back to the chassis unit. The triplex and quad modules are most commonly used at the main viewing location but can also be installed in other locations for future use e.g. additional Satellite decoder. Two CT100 or equivalent cables should be run from each of the Triplex and Quad module locations.

More detail on the configuration of the TV system can be found on page 6.

# System Chassis or Central Unit

The system chassis is a compact enclosure with a removable cover or hinged lid. Both chassis feature a simple swing frame which allows a modular approach to installation and permits the flexibility to make changes for future expansion. The cables from external telecoms services and external FM/UHF/IF antennae should also be routed to the chassis.

The chassis contains patch panels for termination. Colour coded labels are used for identification.

Service	Label	Connectivity
Telecom's	Green	IDC or RJ 45 Terminations
Telephone Outlets	Green	IDC Terminations
Data Services	Red	IDC Terminations
Audio	Silver	IDC or RJ 45 Terminations
CCTV	Orange	IDC Terminations
Television	None	F-Type Coaxial Terminations

The TV cables are attached directly to a Domestic Distribution Unit (DDU) amplifier which is mounted inside the chassis. The IDC patch panels are compact 4 port modular panels. The chassis has ample room to mount an ADSL modem/switch for networking data.

Two chassis sizes are available:

- Full Size with removable lid (dimensions h434, w435, d162)
- Half Size with hinged lid (dimensions h434, w255, d150)

The selection of chassis will depend upon:

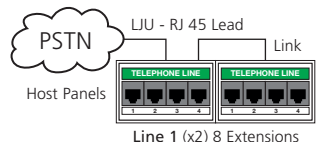
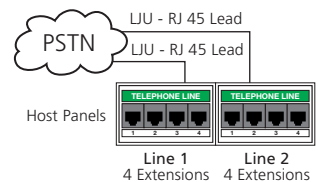
- How many outlets are required in the property?
- How much expansion is expected?
- Will a multiroom audio system be added later?
- Single or multisource audio hubs?
- 5.1 Surround sound install?
- CCTV or Observation packages?
- TV/FM/DAB Satellite distribution?
- In very large installations, full size chassis' may be located above one another. Knockout panels are removed to allow routing of cables between them.

## System Connections

This section describes the operation of each part of the system and shows the relationship of the components using schematic diagrams.

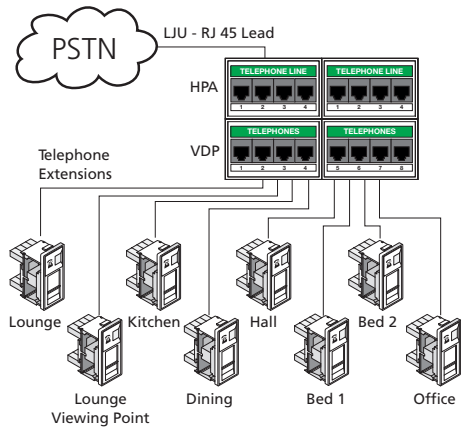
### Telecomm's Services

External Telecomm's services are connected to the host patch panels. These are designed to accept standard analogue telephone services. The connection from the service provider's termination box is by means of a pre-terminated cable which can plug into the front of the panel. This method allows 3 extensions. Alternatively the end of the pre-terminated cable can be removed and terminated on the rear of the panel using the IDC connectors. This method allows 4 extensions. BT's maximum recommendation for a phone line is 4 due to the REN number. **NB:** Host boards can be linked together to provide 8 extensions.



# Telephone Connections

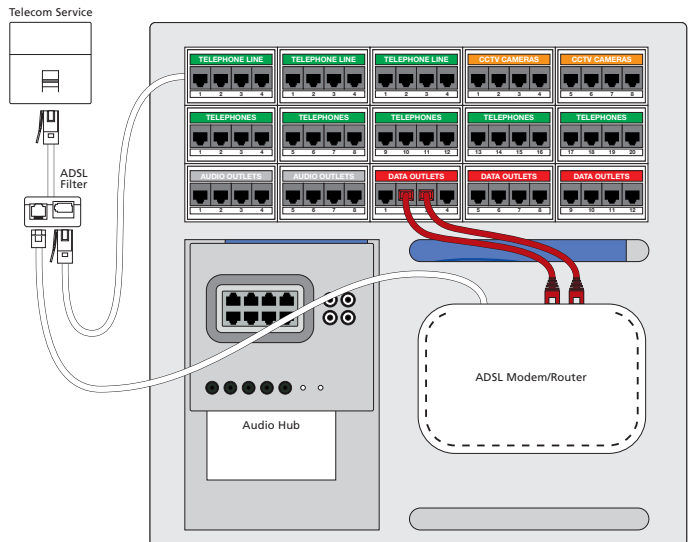
Telephone modules (TM) should be located everywhere in the property where an analogue telephony device (telephone, modem or fax) may be required. The essence of designing the system is to predict where these services will be needed both now and in the future. In general every room should have at least one. The Voice modules are connected back to voice distribution panels (VDP) using Category 5e cables and in turn patched with patch cords to the host panel, analogue (HPA). Each Voice distribution panel can support up to four telephone modules.



# Data Services Distribution

Data Modules (DM) should be located everywhere in the property where the presentation of a data service may be required. This includes "Broadband" services (SDSL and ADSL) and Ethernet for networking computers and printers etc. This requires great consideration as these will form the future connectivity for the customer. It is likely many video and telephony devices will in the future be replaced with data terminals serviced by central servers and external digital services. The data modules are connected back to the data distribution panels by Cat 5e cables. Four modules can be connected to each panel. SDSL or ADSL

(Broadband) services may be connected directly from the data distribution panel to the router, which in turn is connected to the telephone provider via a filter. The use of a router provides shared access to the internet for multiple computers or devices in the home. A firewall and the latest in encryption are standard with the hardware, so security can be assured.



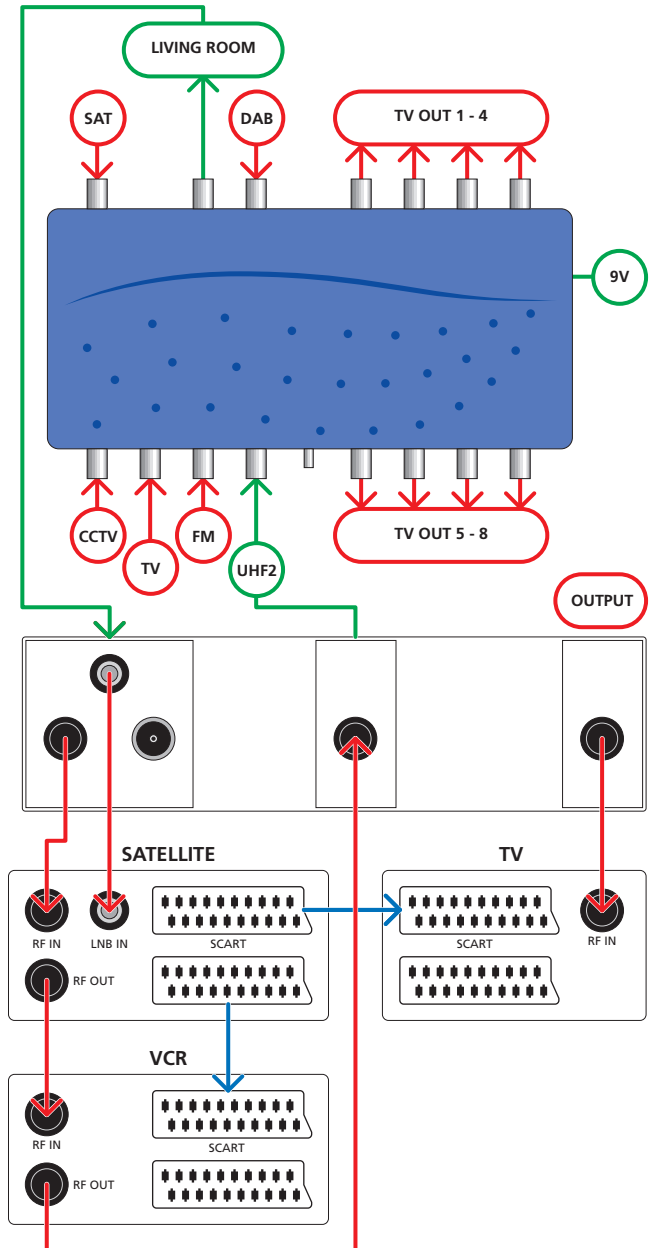
Full size chassis shown

# Television Distribution

The television system is split into two main areas

- 1) Mixing of external and internal signals
- 2) Distribution of the combined signals around the property.

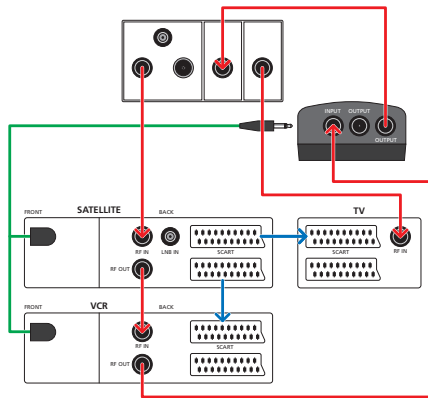
All of the external signals should be fed into the DDU. This has inputs for FM, Digital Audio Broadcast (DAB), Terrestrial TV (UHF), CCTV (Modulated) and Satellite (LNB). Power is supplied from a small external power supply unit (PSU). The combined feeds are passed down into a Triplex outlet plate which should be located in the main viewing point (usually the lounge). From here the signals are separated into FM, UHF and IF. These are connected to the appropriate decoding and receiving equipment. The UHF component is routed through the equipment and returned to the distribution section of the amplifier (RFDP) via a simplex module at the main viewing location and CT100 cable. A second LNB feed may also be routed to the main viewing point to accommodate SKY+ or an additional decoder by using the Quad outlet.



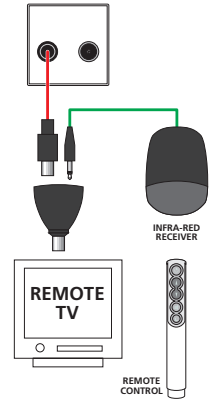
# Infrared Passing Control System

To allow control of Satellite Receivers and Video Recorders remotely, the TV distribution system allows the passing of IR (Infra-Red) signals over the coaxial (CT100) cables. To achieve this IR passing components must be used. These are the IR receiver module (IRM) to be placed in each location where IR control is required and an IR emitter (IRE) placed at the main viewing point.

## VCR & SATELLITE AT MAIN TV VIEWING POINT



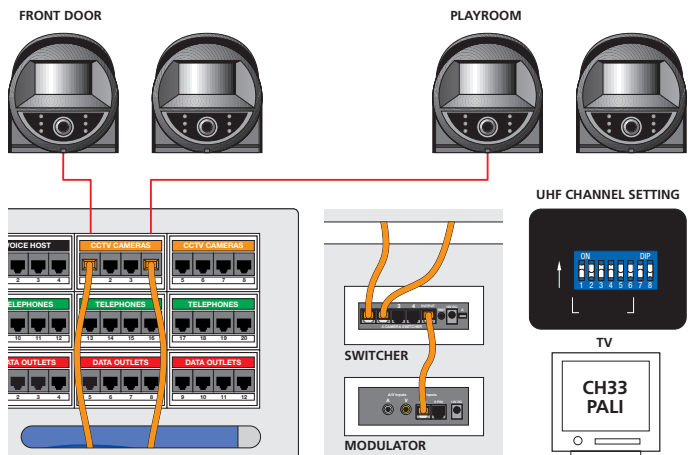
## REMOTE LOCATION OUTPUTS



# CCTV Security Systems

The Cameras used with the system are connected back to the CCTV patch panel (CCP) at the chassis with Category 5e cable. The connection is direct to screw terminals within the camera housing. A single camera will be connected to a modulator (CCM) mounted in the chassis unit and then connected to the CCTV input on the Television Mixer (RFMP) panel using a CT100 coaxial lead. The modulator output is tuned to an unused channel and camera images can be viewed on televisions connected to the system.

Black/White and Colour cameras both with sound are available. If more than one camera is used the patch panel is connected to a switcher (CCS) which automatically steps through the cameras. The output from the switcher is connected to the modulator which is in turn connected to the Mixer Panel (RFMP).



# HNS Structured Audio Solution

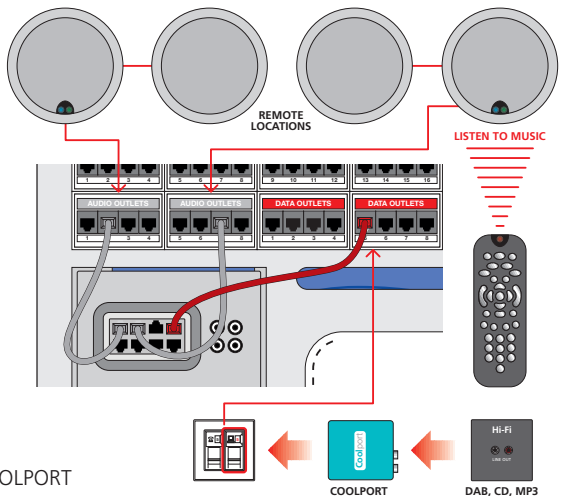
The HNS audio system is available in two forms; single source and multi source, both allowing distribution of audio to multiple rooms from a central source. The single source hub allows a single source of audio (CD, mp3 player, DVD, SAT, etc.) to be distributed to up to 6 zones. The multi source audio hub allows up to 6 sources of audio to be distributed to up to 8 zones. The single source hub can be linked to additional single source hubs, increasing the single source of audio from 6 zones to 12! (Note: multi source audio hubs cannot be linked together.) When 1 to 6 zones are being used on a multi source hub a single power supply will suffice. However when 7 to 8 zones are in use two power supplies are required. The source input can be made at any RJ 45 socket around the property by using a COOLPORT. Dedicated source input face plates may also be used. The volume and other controls can be operated in each room by the use of the integrated IR passing via speakers, keypads, and or input face plates; this also allows equipment to be controlled remotely. All connections for the audio system are made using Category 5e cables.

## The main system components are:

- 1) Chassis Mounted Hub Units (Single source or Multi source): The Single source unit is designed to offer a low cost entry level product which can be upgraded at a later date, as long as pre-cabling for additional zones is present. The audio source may be connected directly to the hub or indirectly over a structured cabling link by means of a COOLPORT adapter.
- 2) Active and Passive Speakers: The ceiling speakers are provided in pairs. The active unit is connected to the chassis hub using Category 5e cabling. An additional Cat5e cable is then used to connect the passive and active speaker to each other. Speakers may be supplied with an integral IR receiver in which case a keypad is usually optional.
- 3) Keypads: Wall control keypads are connected by Cat5e cables to the Active speaker to give local control without the use of IR hand sets. However keypads also feature IR, so remote handsets may also be used.
- 4) Local Input: Any RJ 45 socket can be utilised and used as a local audio input to the system; this is done by means of a COOLPORT audio module.
- 5) COOLPORT Audio Module: This adapter allows for conversion of the Audio source for use over structured cabling. The COOLPORT presents two phono type input sockets and two 3.5mm jacks for IR control output.
- 6) Power Supply Units: Two power supply units are available for the Audio System; a 45w unit and a 135w unit. The power supply units plug directly into the Audio Hub and in turn power the speakers. We recommend the 135w PSU for higher power or multiple zone installations.

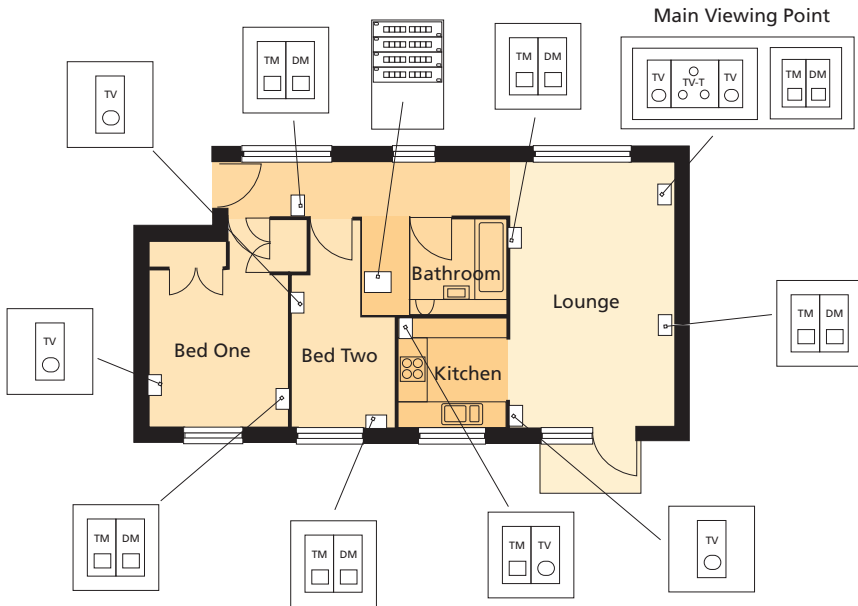
## Single source hub shown

- Full control, with or without in-wall keypads
- Integrated 5.1 surround sound options
- Active in-ceiling speakers or conventional speaker option available
- Audio and video distribution solutions (Note: multi source audio hub is required for video distribution)
- Location free audio source(s) using the COOLPORT





# Design Applications - 2 Bed Apartment



## Bill of Materials

Qty	Description	Part Number	Price List*
<b>Outlets</b>			
7	Voice Module	HC EC06V	Page 8
6	Data Module	HC EC08D	Page 8
1	Triplex TV Module	HC ECTV-T	Page 8
6	Simplex TV Module	HC ECTV	Page 8
10	Single Gang White Faceplate	HC FP01	Page 9
1	Dual Gang White Faceplate	HC FP02	Page 9
<b>Chassis</b>			
1	<b>HC MINI Chassis Kit</b>	HC MMCH MINI KIT01	Page 1
<i>Includes</i>			
1	1/2 Size Chassis & Lid	HC MMCH W	Page 2
2	4 Port Host Telephone Host Kit	HC 04 HOST KIT	Page 3
8	Voice Patch Leads Green	HC G30	Page 3
4	4 Port Distribution Module	HC 04 GLOBAL	Page 4
1	Hub Mounting Plate	HC MMB3 W	Page 2
1	8 Way TV Distribution Amp	HC TV 08 IRL	Page 4
<b>Optional Items</b>			
1	4 Port ADSL Modem Router	HC MM ADSL	Page 3
4	Data Patch Leads Red	HC R30	Page 3

# Design Applications - 4 Bed House



**NB:** Please download a typical audio design application from [www.homenetworksciences.com](http://www.homenetworksciences.com)

## Bill of Materials

Qty	Description	Part Number	Price List*
<b>Outlets</b>			
13	Voice Module	HC EC06V	Page 8
11	Data Module	HC EC08D	Page 8
2	Triplex TV Module	HC ECTV-T	Page 8
5	Diplex TV Module	HC ECTV-D	Page 8
5	Simplex TV Module	HC ECTV	Page 8
18	Single Gang White Faceplate	HC FP01	Page 9
2	Dual Gang White Faceplate	HC FP02	Page 9
<b>Chassis</b>			
1	<b>HC Large Chassis Kit</b> <i>Includes</i>	HC MMCF LARGE KIT01	Page 1
1	Large Size Chassis & Lid	HC MMCF W HT	Page 2
2	4 Port Host Telephone Host Kit	HC 04 HOST KIT	Page 3
8	Voice Patch Leads Green	HC G30	Page 3
6	4 Port Distribution Module	HC 04 GLOBAL	Page 4
1	Hub Mounting Plate	HC MMB3 W	Page 2
1	8 Way TV Distribution Amp	HC TV 08 IRL	Page 4
<b>Optional Items</b>			
1	4 Port ADSL Modem Router	HC MM ADSL	Page 3
4	Data Patch Leads Red	HC R30	Page 3
1	<b>CCTV Observation Kit</b> <i>Includes</i>	HC CCTV OB2	Page 4
1	4 Way CCTV Switcher	HC SP 04 SWITCHER	Page 4
1	Wide Band Modulator	HC SP MODULATOR	Page 4
2	Black & White Camera	HC SP BW CAMERA	Page 4

\* Price List available on request. Please email [hns@htdata.co.uk](mailto:hns@htdata.co.uk) or call **01604 707420** for your copy.

# Home Network Sciences

a smarter way to live...

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