TRIAX

connecting the future

# Commercial Systems

| TRIAX integrated reception systems
- remove the limits from your installation


Television at the Speed of Light

# Fibre beats Coax

| Advantages for the installer, tenant and landlord in residential complexes

## Advantages for tenant and landlord

### TRIAX offer a complete range of solutions for fibre installations.

TRIAX fibre is your preferred choice when you want:

- One discreet headend - distribute satellite, digital terrestrial and radio signals from a single location
- Design a system over a large area without jeopardising signal and quality
- Install a single fibre cable only rather than multiple coaxial cables

## Advantages for installers

Great for saving time at SAT installations

- High reliability
- Significant cost savings
- Future-proof
- Noise distortion and interference-free transmission

## The fibre possibilities

- Very long distances with minimal attenuation
- Lighter and thinner than coaxial cable
- Pre-assembled cables up to 500 m
- UV-resistant
- No potential and transient currents
- No influence by external electric or magnetic fields
- Cost savings for thermal insulation and fire protection

TRIAX
connecting the future

Television at the Speed of Light

## Advantages for tenant and landlord

- Very short installation times
- Best possible quality
- Maximum flexibility
- High fire safety
- Future-proof
- Energy saving in comparison to multiswitch installations

## When upgrading or new installation

- Receive all broadcast via satellites
- Supply several hundred apartments with only one Satellite dish station
- Increased user satisfaction
- Building aesthetics
- A fibre optic cable replaces four coaxial cables per satellite position
- 30 - 60% cost savings compared to alternative solutions
- Trouble free media supply

## Television at the speed of light



# It Starts at the Roof

| Reception technology - the Quality Coverage of tomorrow

## Satellite Reception

Quality of Signal is imperative with any Satellite System and the key to quality signal is an appropriately sized dish and high quality LNB.

Triax's range of solutions for satellite reception include:

- TD Dishes: For installers who want to minimize installation time and for end-users demanding a long lasting quality solutions
- DAP Fibre Glass Dishes: Extra high durability for extreme conditions (eg. coastal areas and mountain regions)
- A full range of LNB Units Available in Single, Dual, Quad, Quattro and Full Band Fiber Optic versions.
    - Full ku-band coverage for digital reception
    - Excellent noise figures (<0.6 dB)
    - High cross polarity isolation (typically >25 dB)
    - Positive gain slope to prevent high band intermodulation problems
    - Low power consumption
    - Waterproof and qualified for harsh environments


## Terrestrial and FM/DAB Reception

LTE protected? Uses the Correct Aerial - NOT a filter
All these new Aerials carry the "LTE Protected - by Triax"

Worldwide the frequency band 790-862MHz (channel 61-69) is gradually being discontinued for DTT use (Digital Terrestrial TV). Instead the frequency band is used for mobile broadband services using LTE (Long Term Evolution) and/or LTE Advanced technology.

This poses new challenges to DVB-T installations as wideband antennas historically are constructed to peak with maximum gain above 790 MHz (E61), and receive up to 862 MHz (E69) and Triax has developed a whole new range of aerials (and other products) to address this challenge.

Triax aerials are manufactured to withstand the toughest environments encountered in coastal, windy and sunny areas.

We utilize quality materials, conduct UV test, salt spray test, and stress test our products with more than 100,000 vibrations.

This is done to ensure that the aerials meet Triax's quality requirements.

# It Starts at the Roof

| Triax Quality Reception Products


TDA Aluminimum Dish
Commerical 78 & 88cm


TDS Steal Dish
Commerical 78, 88, & 110cm


DAP Fiber Glass Dish
Commerical 71 & 91cm


Satellite Surge Protector
Terrestrial Lightning Arrestor

Low Noise Single LNB
LO - 10750 or 11300

Low Noise Quattro LNB
LO - 10600

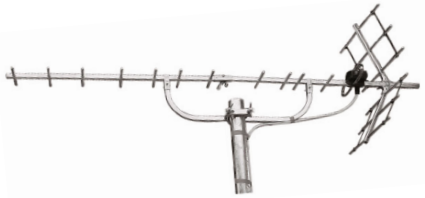
Optical Full Band LNB
LO - 10600

IP LNB
LO - Variable

15 Ellement YAGI
CH21-47 Gain 12-13dB

Omni Directional FM
Gain 2dB

Directional FM YAGI
Gain 6dB



18 Ellement YAGI
CH28-36 Gain 15dB

# The Head End

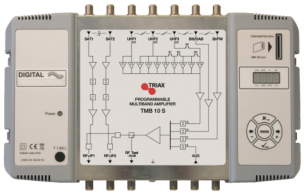
| Make the right choice - Take control of your system



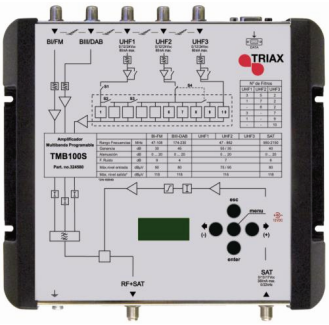
## With Triax TDX and its smaller brother TDH800
## Forget everything you knew about Headends!

With new IP Pool Technology Headend design has never been more flexible. Independently distribute any input source to PAL, QAM, COFDM and IP at the same time. Send full HD Digital to every TV.

- Have total control of your digital TV's and their Channel Numbering
- Sky HD to every TV with Sky Cards loaded directly into the Headend
- Easily integrate IPTV and Video On Demand Services
- With encryption services, control what channels a room has access to. Directly form Reception or The Hotel Office.
- Remote Management from any PC.
  Log in and reprogram the System and the Digital TV's with a few clicks of your mouse.
- Amazing input flexibility allows for cost-effective in-house channels to be created for advertising and guest information.








## Channel Filtering
## Avoid the noise, Avoid the interference.

The window for TV Broadcasting has narrowed considerably over the past years with the switch to Digital and it will not stop here.

With Cell Phone communications and Digital Radio transmissions ever encroaching on the Digital TV Band Filtering is becoming more critical for larger MATV Systems around the country.

Filtering should start on the roof with a YAGI Aerial that has been precisely engineered to reject unwanted signals. You should always avoid using wideband aerials such as a Phased-Array on a commercial installation.

Although there are times where the aerial system is pre-existing or you find your self close to nuisance broadcast sources and more aggressive channel filtering will be necessary. Triax have every situation covered.




## Is one Satellite Enough?
## Future proof your system to meet customers needs.

The Opto-LNB consists of low noise block converter and an optical transmitter. The LNB stacks the 4 SAT-IF-bands of a SAT-Position into a super broadband IF of 950...5450 MHz. Thus the 4 SAT-IF-bands can be transmitted over one fibre line.

- Stacking LNB with optical output for splitting to max. 32 or 64 fibre links
- Optical wavelength 1310 nm
- Power supply via external power supply (included) via F connector
- Compatible with optical re-converter TVQ (Quatro) and TVC (Quad) as well as Opto Multiswitch TOM

# The Head End

| Triax Flexible Filters, Channel Processors, Headends

**Triax TDX Headend**
**Full Digital and IP**

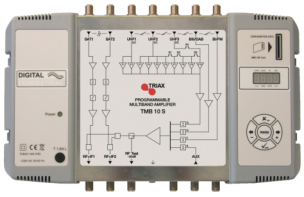

**Triax TDH800 Headend**
**Full Digital**

**Triax Encription Server**
**for IPTV and COFDM**

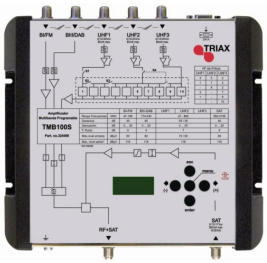
**Triax Video On Demand**
**Server - Fully Customizable**


**Triax CatTV**
**12 TV Outlest over Cat6**

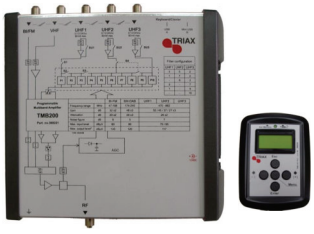

**35db Launch Amp**
**6 Channel Filters**




**40 dB Twin Trunk Amp**
**10 Channel Filters**




**40dB Single Trunk Amp**
**10 Channel Filters**




**10 Channel Filter Amp**
**Remote Programer**

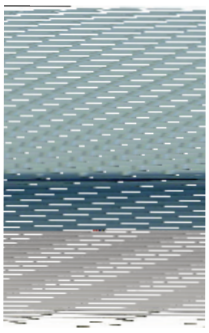
**Low Noise 30dB Amp**
**RF Light Commercial**

**Low Noise High Power 40dB**
**Amp RF Large Commercial**


**40dB Twin Trunk**
**Launch Amp**

**RF - Optical Transmitter**
**Various Power Outputs**


**LNB Fibre Transmitter**
**With Terrestrial**



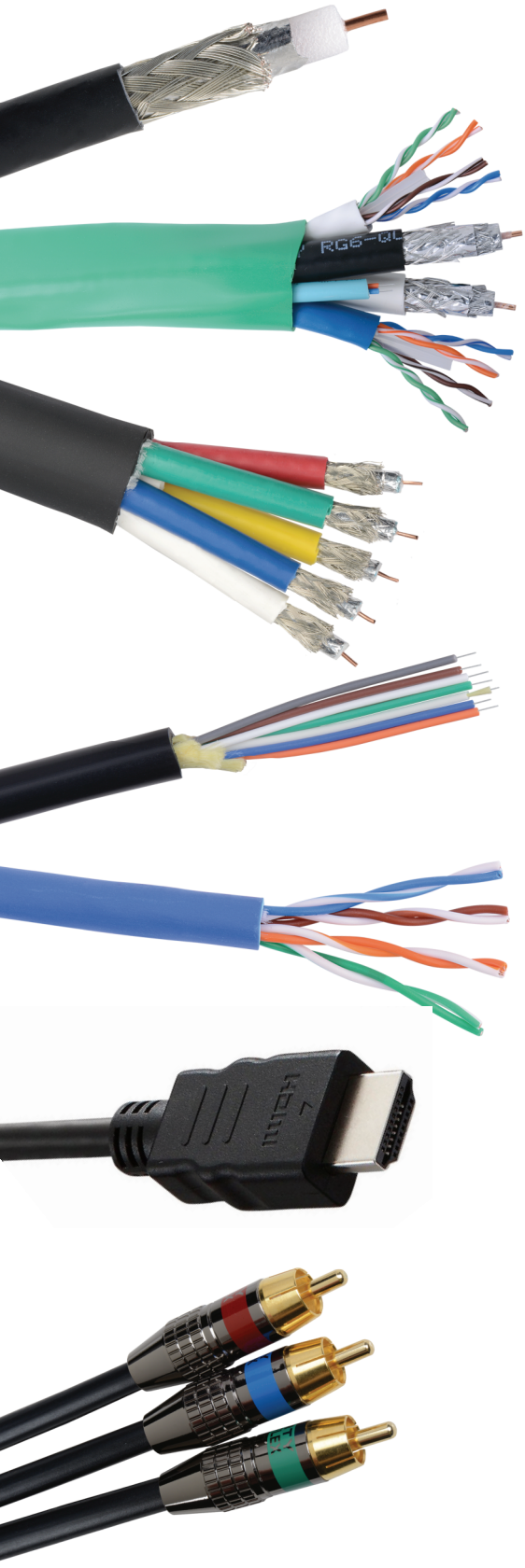
**Fibre Stacker - 4 LNB's**
**and Terrestrial Single Fiber**

**High Power Optical Transmitter**
**Subdivision or Towns**

**Note:** The above is a small selection of the Commercial Range

# Distribution Methods

| Signal Distribution - The Triax Way



## COAX

COAX is the traditional method for distributing Digital (COFDM), Analogue (PAL) and Satellite (SAT-IF) signals around a building or Complex.

Though Coax has limitations in distance and can require complex cable structures for multi-satellite networks, Coax is still an integral part of a Fiber distribution System. And can still be the most cost effective distribution method for smaller sites.

## HFC - Hybrid Fiber / Coax

HFC-TV is a mix of Single Mode Fiber and traditional Coax distribution. TV signals taken from Satellite and Terrestrial networks are outputted as Digital (COFDM) and raw Satellite signals (SAT-IF).

The HFC method of delivery is well suited to larger sites or even subdivisions and can allow for multiple satellites to be sent down a single Fiber Cable.

## CatTV - RF over Category Cable

CAT-TV is a method of transmission, this method takes the lower band signals of a HFC network and distributes them over CAT cables. - Does not include SAT-IF signals.

CAT-TV can be run along side Phone and Data Services over the same category cable. Making it easy to integrate with Video on Demand (VOD) Services.
This allows use of the TV's built in tuners and features.

## IPTV - Internet Protocol Television

IPTV is the method of delivering television channels over category cables via IP (Network) data - Using UDP or Multicast technology.

This can also include access Over The Top Services (OTT) such as Video On Demand (VOD)- Internet based channels and streaming services like YouTube. This is basically a computer network.
Though should never be Merged with the Computer Network on Large sites or where mission critical applications are being run.

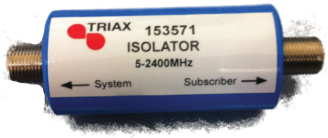
# Distribution Methods

## | Triax Signal Distribution Products

**Triax SCS Splitters**
**High Quality Low Loss**

**Traix SCS Taps**
**High Qulaity Low Loss**

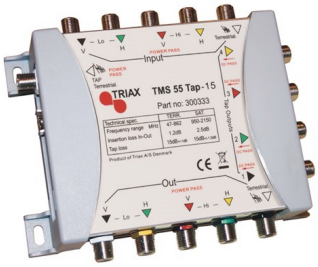

**Triax Sat / RF**
**Coupler / De-Coupler**



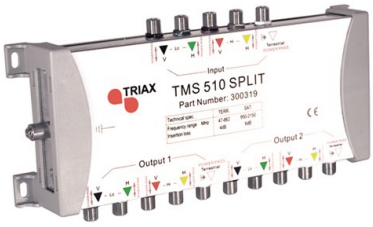

**Triax Ground Loop Isolator**
**For Inter Building Protection**

**Triax TMPR Multiswitches**
**Line and Solar Power Options**

**Triax TMP Multiswitches**
**8 - 32 Way Versions.**




**Triax TMS Tap**
**for Multiswitch Systems**




**Triax TMS Splitter**
**for Multiswitch Systems**


**Triax CatTV**
**RF signals over Cat Cable**

**Triax Quality Cat6**
**Patch Pannels & Fittings**

**CatTV Balun**
**Connect direct to the TV**


**Triax CatTV Balun**
**For Variable Cable Lengths**


**Triax Passive Dual Window**
**Optical Taps & Splitters**


**Triax Optical Receivers**
**for RF only systems**


**Fiber Destacker- 4 LNB's**
**and Terrestrial back to Coax**


**Fiber Destacker- Single LNB**
**and Terrestrial back to Coax**

# Coax Network Examples

| Single Trunk Coax Network

## Single Trunk Coax

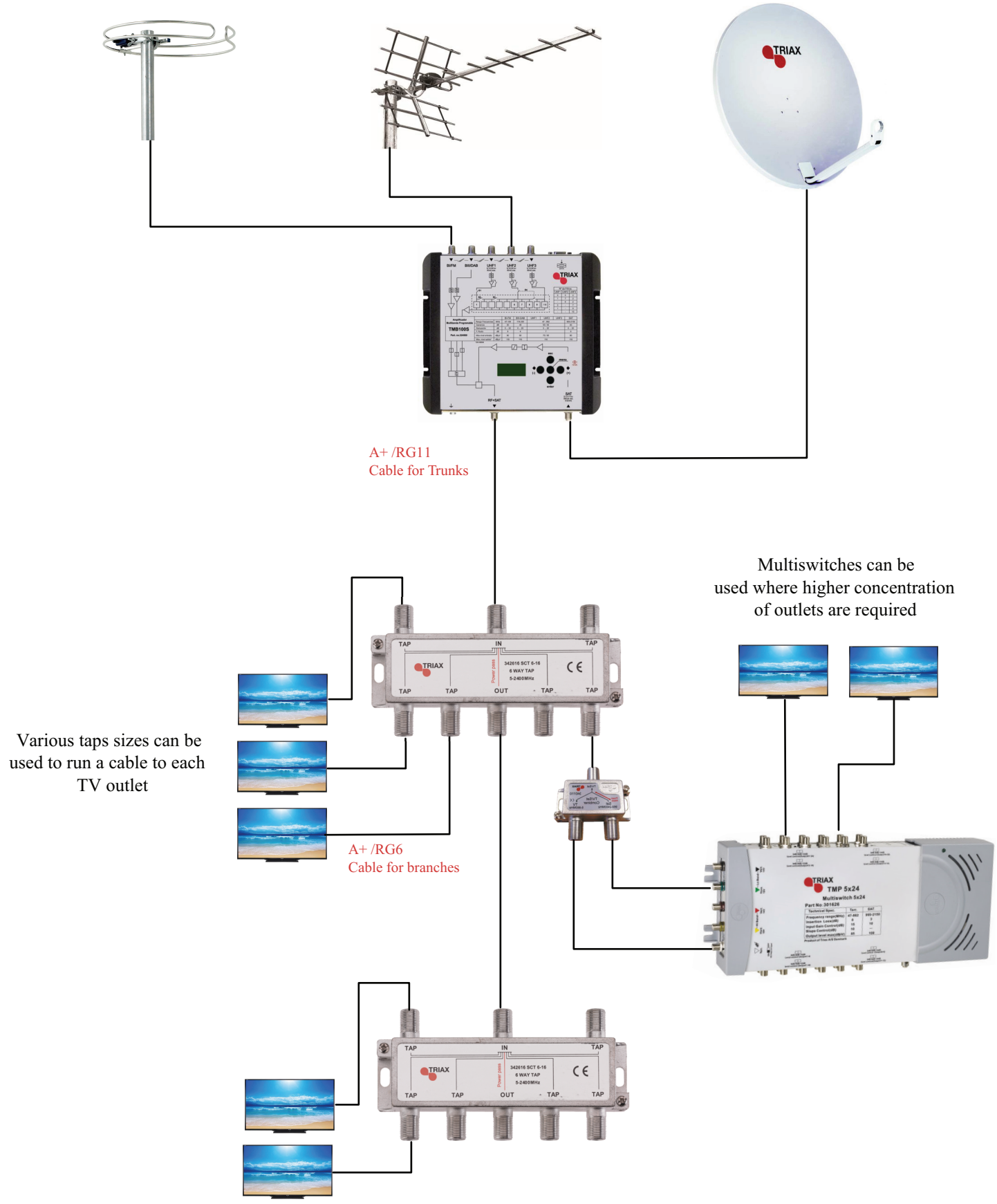
The traditional method employed to distribute a single satellite polarity and UHF signal around a building or complex is over a single coax cable.

- Easy Installation.
- Covers the needs of most traditional sites.
- Allows for Sky receivers to be used at any outlet.
- Suitable for Analogue TV - Supporting old TV's
- Custom information services can be added,
  -- See Samsung reach server
- Works with Freeview Digital Televisions.
- Will support Triax Headend Solutions

- Size of system is limited by physical distance
- Not suitable for Video on Demand without expensive hardware.
- Extra Satellite polarity's or orbital positions are not able to be supported.
- Suitable for Analogue TV - Supporting old TV's
- Needs balancing by qualified technicians

# Coax Network Examples

## | Single Trunk Coax Network Digram



# Coax Network Examples

| Twin Trunk Coax Network

## Twin Trunk Coax

### Or Multi-trunk (Multiswitch Systems)

Similar to the single Coax trunk method the multi trunk systems allows for the distribution of multiple satellite polarity's and a UHF signal around a building or complex over a number of coax cables.

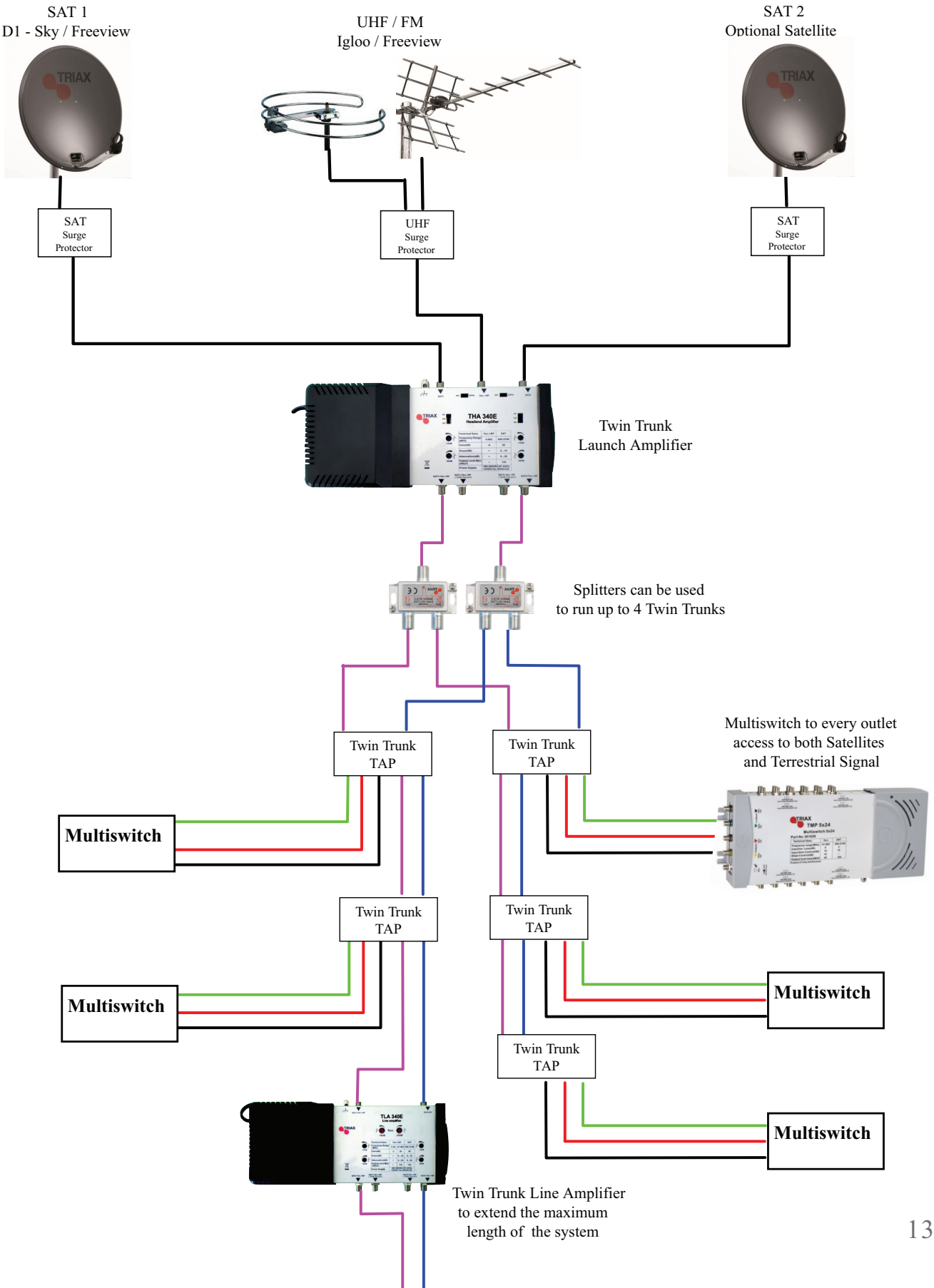
If structured correctly this type of system can be quickly deployed to service everything from a home to a Hotel or Apartment complex.

- Mildly complex to install.
- Provides for extra services and redundancy.
- Allows for Sky receivers to be used at any outlet.
- Suitable for Analogue TV - Supporting old TV's
- Custom information services can be added,
- Works with Freeview Digital Televisions.
- Will support Triax Headend Solutions

- Size of system is limited by physical distance
- Not suitable for Video on Demand without expensive hardware.
- Suitable for Analogue TV - Supporting old TV's
- Needs balancing by qualified technicians

# Coax Network Examples

## | Twin Trunk Coax Network Digram



# CatTV Network - Coax

| RF and Data Cat6 Network - with SkyTV

## CatTV - Coax

Similar to the single coax trunk method the CatTV system allows for the distribution of UHF signal around a building or complex.  Though trunks cabling is still run with coax the final subscriber lines are Cat Cable.

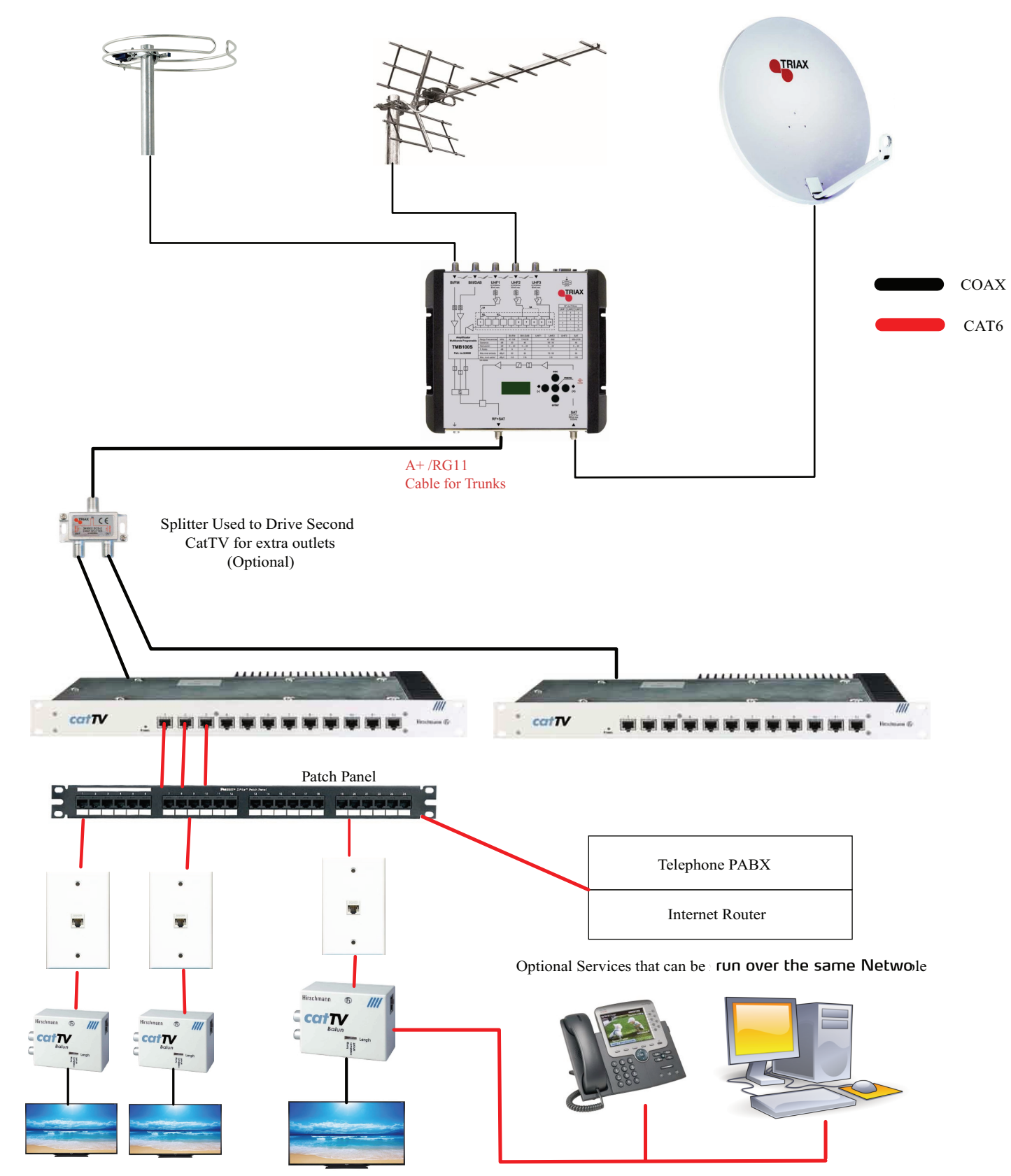
If structured correctly this type of system can be quickly deployed to service everything from a home to a Hotel or Apartment complex.

- Mildly complex to install.
- Easily retrofit a building with Cat cable in place.
- Can share cabling with IP and Phone services.
- Custom information services can be added,
- Works with Freeview Digital Televisions.
- Will support Triax Headend Solutions

- Size of system is limited by physical distance.
- Not suitable for Video on Demand.
- Satellite signals (IF or L band) cannot be distributed down category cable.

# CatTV Network Example

## | RF and Data Cat6 Network



# CatTV - Fibre Network

| RF and Data Cat6 Network

## CatTV - Fibre

Similar to the single coax trunk method the CatTV system allows for the distribution of UHF signal around a building or complex.  Here we use Fibre Optics for the trunk cables with final subscriber lines being Cat Cable.

If structured correctly this type of system can be quickly deployed to service everything from a home to a Hotel or Apartment complex.

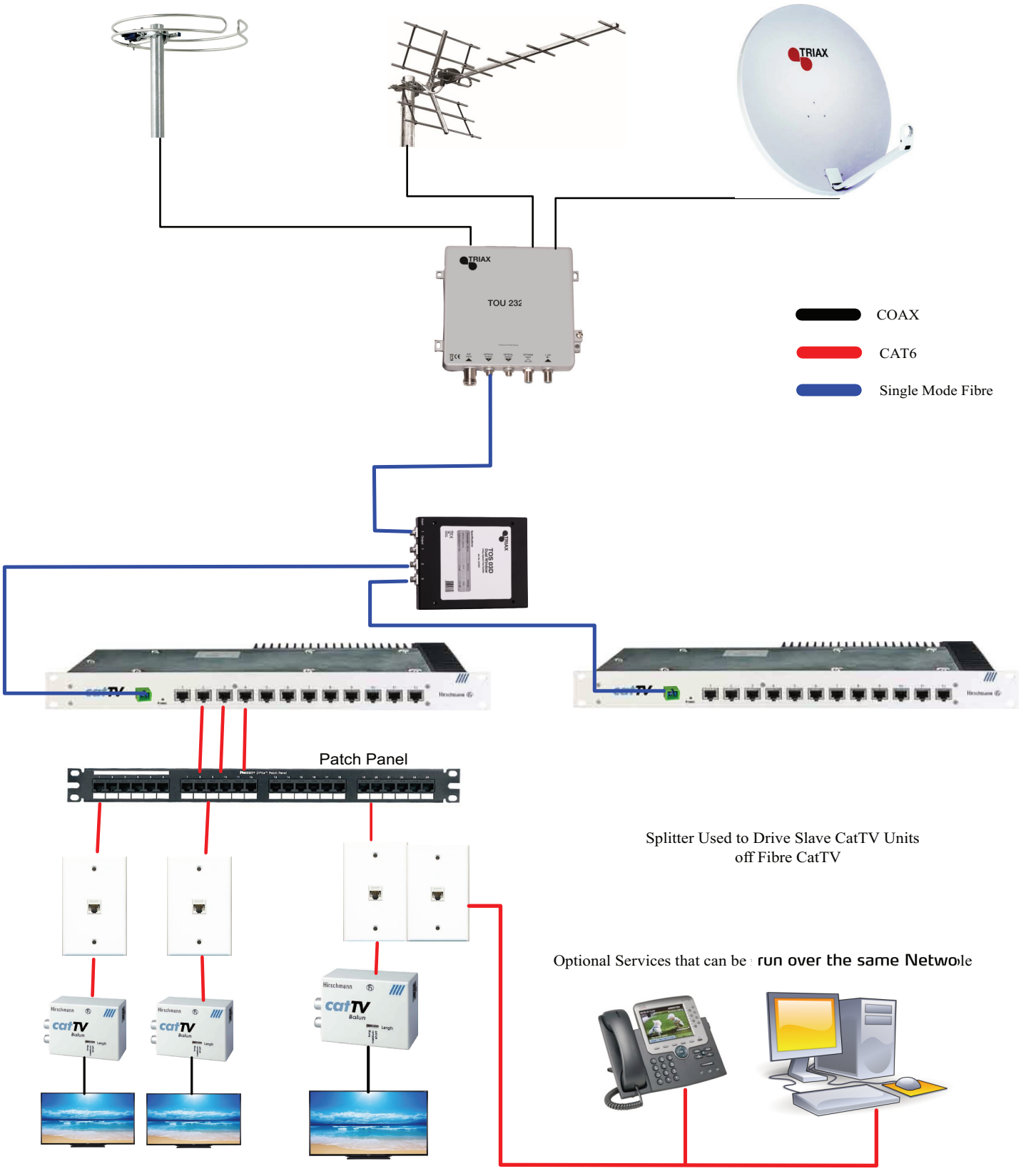
- Mildly complex to install. - Pre made Triax fibre cables available.
- Easily retrofit a building with Cat cable in place.
- Can share cabling with IP and Phone services.
- Custom information services can be added,
- Works with Freeview Digital Televisions
- Size of system is almost limitless.
- Will support Triax Headend Solutions

.

- Not suitable for Video on Demand.
- Satellite signals (IF or L band) cannot be distributed down category cable.

# CatTV/Fibre Network Example

## | RF over Fibre Cat6 Network - with SkyTV Digram



# Hybrid Fibre / Coax Network

| Fiber to the Floor - Single Satellite

## Fibre to the Floor

Similar to the single coax trunk method this Fibre system allows for the distribution of a single satellite signal and UHF signals around a building, complex or subdivision.
Here trunks are run with Fibre optics making distance limitations a thing of the past.

If structured correctly this type of system can be quickly deployed to service everything from a Hotel, Apartment complex or sub-division or small town.

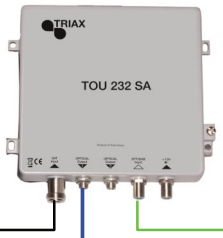
- Mildly complex to install. - and similar pricing to coax..
- Easily retrofit buildings as the final distance is coax.
- Sky receivers can be used at any outlet.
- Custom information services can be added,
- Works with Freeview Digital Televisions
- Size of system is almost limitless.
- Will support Triax Headend Solutions

- Not suitable for Video on Demand.
- Only for one Satellite orbital position.
- Not suitable for Analogue TV

# Hybrid Fibre / Coax Network Examples

## | Fiber to the Floor - Single Satellite Digram

Headend Suitable



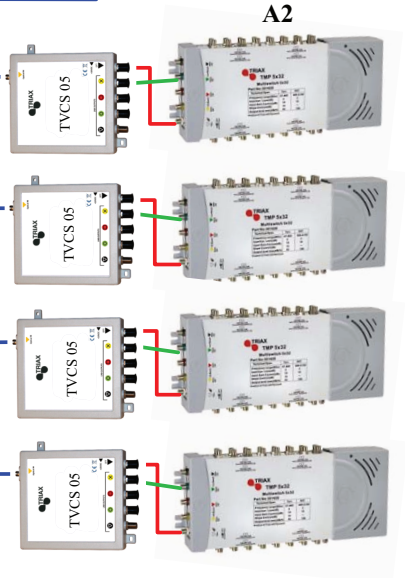

Optical Fiber
Coax - Satellite
Coax - Terrestrial
N-Type - 50 Ohm - Coax




Fiber Optic Multiswitch

Building A1

Building A2




Building A3

Optical De-Stacker

Traditional Multiswitch

To Extra Floors

To Extra Floors

# Hybrid Fibre / Coax Network Examples

| Fiber to the Building / House - Single Satellite

## Fibre to the Door

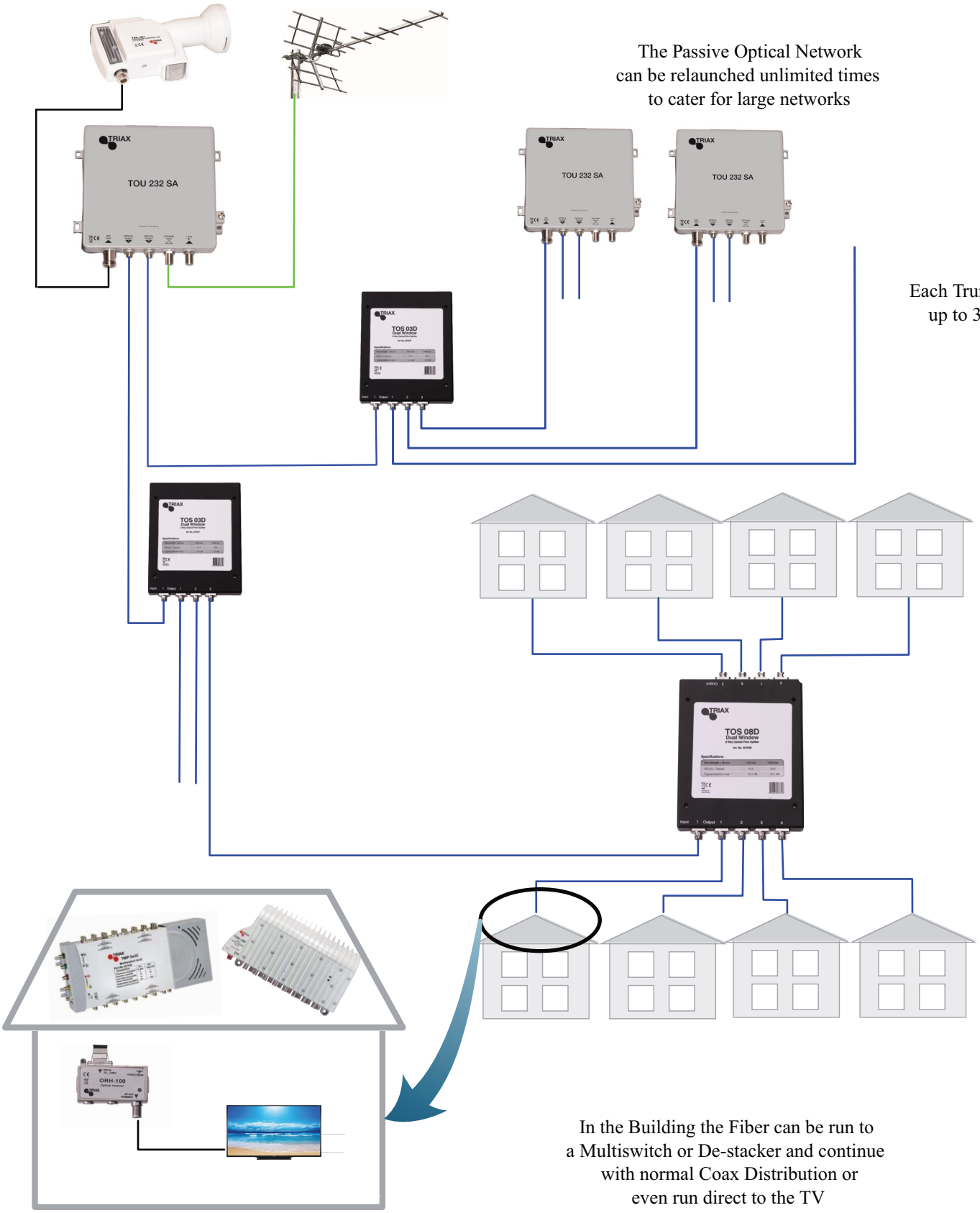
Here the Fibre to the floor systems is expanded to distribute a single satellite signal and UHF signals around a complex, subdivision or small town.
Here trunks are run with Fibre optic cable making distance limitations a thing of the past.
The building coax is still in traditional coax or a hybrid system.

- Use a single Dish and Aerial to supply a sub-division.
- Easily retrofit buildings as the final distance is coax.
- Sky receivers can be used at any outlet.
- Custom information services can be added,
- Works with Freeview Digital Televisions
- Size of system is almost limitless.
- Will support Triax Headend Solutions

- Limited to 1024 Fibre nodes.
- Not suitable for VOD
- Only for one Satellite orbital position.
- Not suitable for Analogue Television.

# Hybrid Fibre / Coax Network Examples

## | Fiber to the Building / House - Single Satellite Digram



# Hybrid Fibre / Coax Network

| Fiber to the Floor - Multi-Satellite

## Fibre to the Floor

### Multi Satellite

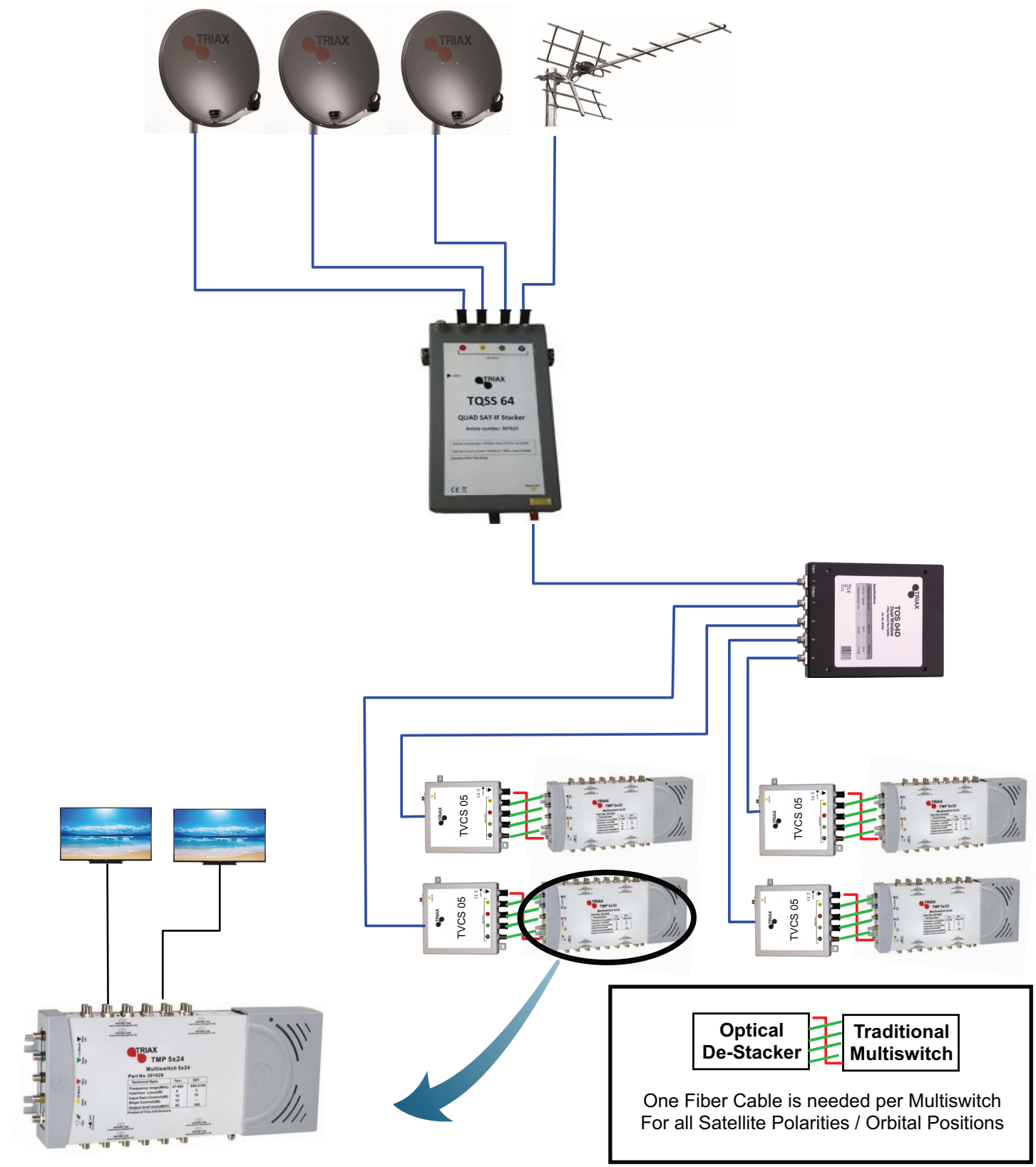
Similar to the multi trunk coax method this fibre system allows for the distribution of many satellites / signals and UHF signals around a building, complex or subdivision.
Here trunks are run with Fibre optic cabling making distance limitations a thing of the past.

- Use a single Dish and Aerial to supply a sub-division.
- Easily retrofit buildings as the final distance is coax.
- Sky receivers can be used at any outlet.
- Custom information services can be added,
- Works with Freeview Digital Televisions
- Size of system is almost limitless.
- Will support Triax Headend Solutions

- Limited to 64 Fibre nodes.
- Not suitable for VOD
- limit 4 satellites
- Not suitable for Analogue Television.

# Hybrid Fibre / Coax Network Examples

| Fiber to the Floor - Multi-Satellite Digram



# Hybrid Fibre / Coax Network

| Fiber to the TV - Satellite and UHF

## Fibre to the TV

### Satellite and Terrestrial UHF

This Fibre system works exactly like the traditional single trunk coax systems and allows for the distribution of satellite and UHF signals around a building, Complex or Street.
Here the trunks are run with one fibre optic cable making distance limitations and interference a thing of the past.

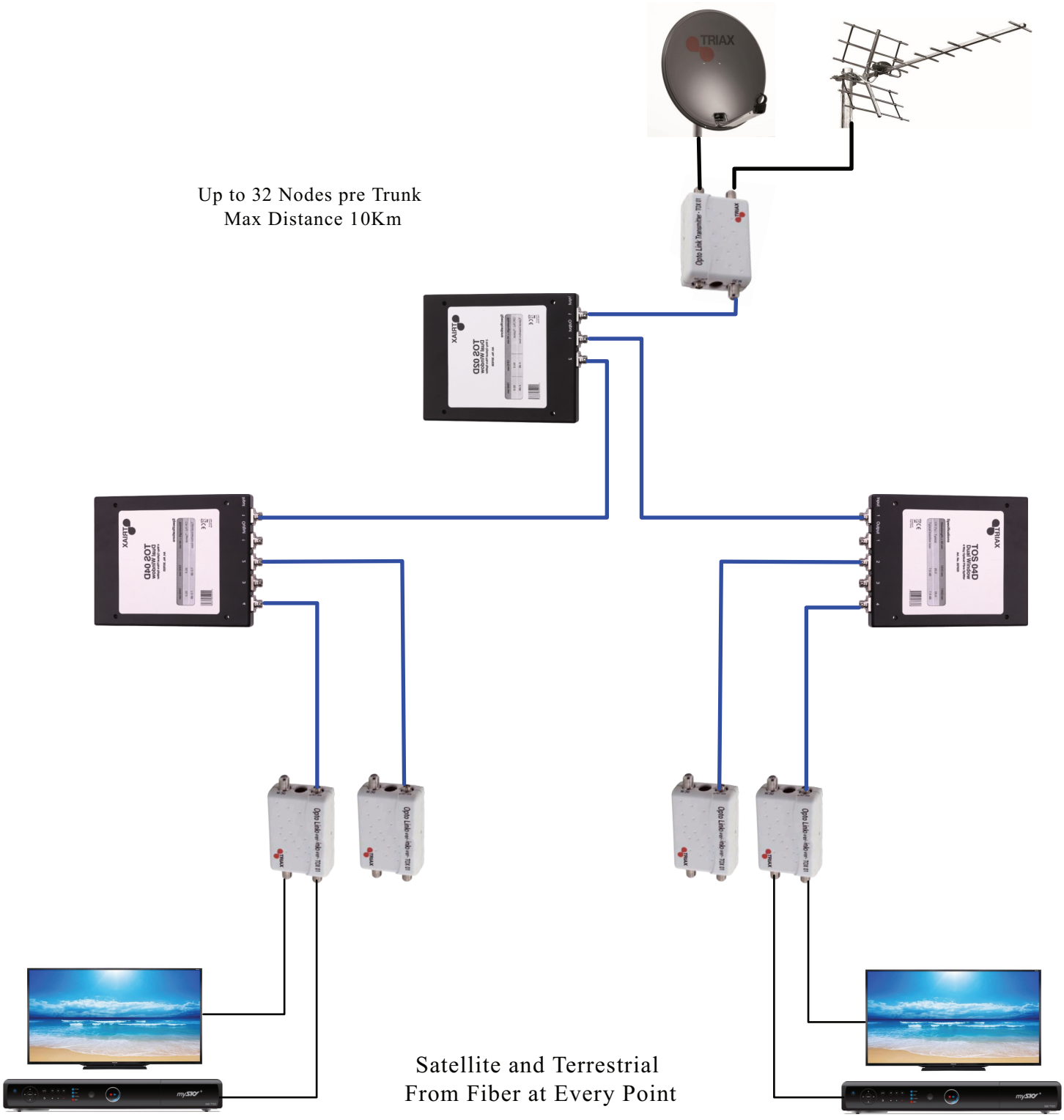
- The new Fibre transmitters and receives do away with coax.
- Simple and easy to install and similar or cheaper than coax.
- Sky receivers can be used at any outlet.
- Custom information services can be added,
- Works with Freeview Digital Televisions
- Size of system is almost limitless.
- Will support Triax Headend Solutions.
- Eliminate any interference.

.

- Limited to32 Fibre nodes per trunk.
- Not suitable for VOD
- limit 1 satellites per fibre.
- Not suitable for Analogue Television.

# Hybrid Fibre / Coax Network Examples

| Fiber to the TV



# IPTV Network

| Internet Protocol TV - with Video on Demand

## Fibre to the TV

### Satellite and Terrestrial UHF

IPTV is the next big thing when it comes to TV channel distribution and allows for a wealth of varied content and over the top services like Video on demand to be delivered to every television. When structured correctly there is no limitation to the size and scope of an IPTV network.

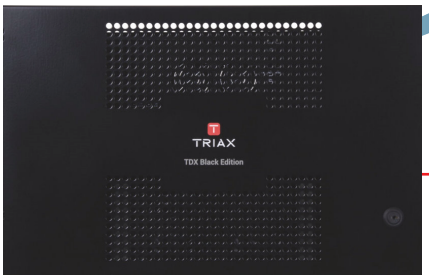
Though it is possible to have IPTV share the same data network as the internet and phone it is highly advisable to run IPTV on its own networks especially where a large number of channels are broadcast or you have mission critical systems on your network.

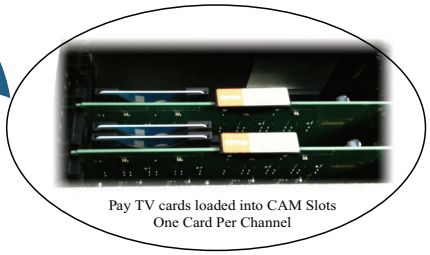
- Video on demand easily integrates into the system.
- Various over the top services can be added.
- Display your TV channels on PC's and Tablets.
- TV's and STB can be controlled from one location.
- Size of system is almost limitless.
- Will support Triax Headend Solutions.
- Possible to add billing systems.
- Messaging to TV

- Sky satellite receivers will not work on the system
- Any HD digital content has to be encrypted before transmission.
- Pay TV systems need Encryption services (CAS)
- Good planning of network required.

# IPTV Network Example

## | Internet Protocol TV - with Video on Demand Digram



Pay TV cards loaded into CAM Slots
One Card Per Channel

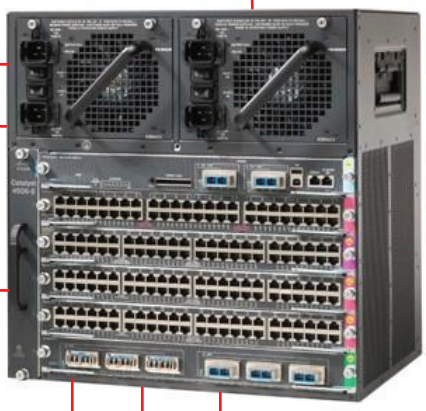
Triax TDX
Headend

Layer 3
Network Switch

Encryption & Management Server

Internet

Video on Demand Server



Layer 3
Access Switch

Patch Panel

Cat6 Cable
HDMI Cable



IP STB


**Other IP Services can run over the same Network if Structured Correctly though it is not recommended for larger sites or where mission critical applications are running**

# Internet Protocol TV

## Samsung SYNC

With our IPTV and dedicated IP Televisions it is possible to add a wealth of features, Using Samsung commercial Television range it is possible to add features like VOD, Channel plans, Guest information services, Welcome pages and access to billing.

- Video on demand easily integrates into the system.
- Various over the top services can be added.
- No STB required
- TV's and STB can be controlled from one location.
- Messaging to the TV
- Will support Triax Headend Solutions.
- Applications can be centrly controlled.

- Sky satellite receivers will not work on the system
- Any HD digital content has to be encrypted before transmission.
- Pay TV systems need Encryption services (CAS)
- Good planning of network required.
- Requires dedicated brand of TV ( Samsung)
- Lots of hardware and complex set up is required.

# Samsung SYNC Solution

## | In House Advertising and TV Management over IP Digram

Satellite Inputs


Terrestrial Inputs

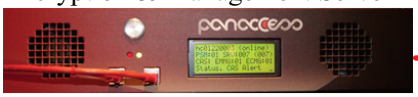
AV Inputs

HDMI Inputs

IPTV Inputs


Samsung LYNC Server
Provides Hotel Info and Controls
Applications and Channels on TV's

Encryption & Management Server



Video on Demand Server

Traditional Computer Network
Layer 3 Switched


Display Hotel / Motel Information
Advertise Local Attractions and Services


Display Messages for Guests
Display Weather Information
Control Applications and Games

Full HD Digital TV and
Video on Demand Over IP

# TV Control Over Coax

## Samsung REACH

With the Samsung REACH server and Triax TDX it is possible to add a wealth of features to your Coax or Hybrid Fibre Coax systems.
Using Samsung commercial Television range it is possible to add features like Channel plans, Guest information services, Welcome pages.

- No STB required
- TV's and can be controlled from one location.
- Messaging to the TV
- Will support Triax Headend Solutions.
- Applications can be centrally controlled.

- Sky satellite receivers will not work on the system
- Any HD digital content has to be encrypted before transmission.
- Pay TV systems need Encryption services (CAS)
- Good planning of network required.
- Requires dedicated brand of TV ( Samsung)
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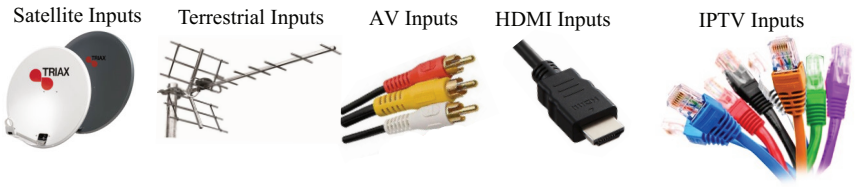
# Samsung REACH Solution

## | In House Advertising and TV Management over COAX Digram





Sky Cards Loaded into CAM Slots
One Card Per Channel

Samsung REACH Server

Provides Hotel Info and Controls TV's

Traditional Coax Network


Display Hotel / Motel Information
Advertise Local Attractions and Services


Display Messages for Guests
Display Weather Information

Fully Digital Freeview and SKY

# The fibre possibilities

Cable Television Networks have a centralized Headend where the signals are processed and then distributed via a fibre optic infrastructure to sub headends.

The centralized CATV headend processes the signals from Terrestrial or Satellite sources converts them to RF and then to an optical output which is then sent out to the network. Internet and return path signals can be added to the fibre network at the main headend.

All of the fibre optic cables are distributed and terminated at the optical receiver or node within the cabinet; this is referred to as fibre to the curb FTTC. The Optical nodes convert the signal from light back to RF so that they can be distributed to the home via coaxial cabling.

The following network structures are now commonplace:

*HFC*

Hybrid Fibre Coax (HFC) networks are ideal for transmitting RF signals with a large bandwidth. It is a combination of fibre optic distribution and coaxial cable for final delivery to the home. The signals travel over large distances through the fibre and are converted to coax for the last 100m. This a cost effective method of delivery as the subscribers only require a termination point within the home.

*FTTX*

FTTX is a collective acronym used within the industry to encompass all distribution methods such as Fibre to the curb (FTTC), fibre to the building ( FTTB) and fibre to the home (FTTH).

*FTTC*

Fibre to the curb (FTTC) is defined as the laying of fibre optic cables to a distribution cabinet at the curb.

*FTTB*

Fibre to the building (FTTH) is defined as the laying of fibre optic cables to the building.
As an example, the fibre optic cables are laid within the existing ducting to the basement of the apartment block. The Fibre is terminated by an optical node and converted to RF where it is then distributed internally via coaxial cable to each apartment.

*FTTH*

Fibre to the home (FTTH) is defined as the laying of optical transmitter directly to the home.

TRIAX

connecting the future

Headquartered in Denmark, Triax is an international supplier of innovative, high-tech solutions for the reception and distribution of video, audio and data signals. The company's products and solutions are used by broadcasters, cable operators, local closed networks and domestic dwelling.

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your ultimate connection

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