

Doordarshan Digital Terrestrial Television (DTT)

In analogue terrestrial television broadcasting only one signal is transmitted on a given frequency channel. Digital Terrestrial Television (DTT) broadcasting allows the transmission of about 10 or more digital services in a single frequency channel, depending on the technical parameters used and the quality of services desired. In the DTT broadcasting process everybody watches the same content at the same time and it guarantees everybody the same high level of service, since they are all bathed in the same signal and that too FTA, whereas in the OTT the received signal quality depends upon number of viewers watching it simultaneously. It is necessary to migrate to digital terrestrial broadcasting as the world is moving away from analogue to digital broadcasting. The television and broadcasting sector has been undergoing significant technological and structural changes, which have given consumers access to a great variety of broadcasting services. **DTT secures greater plurality in Platform ownership, ensuring that no single platform owner is so powerful that they can exert undue influence on public opinion or political agendas.** Developments over the past two decades have led to various technology platforms being able to provide digital television.



DTT Standards: There are many DTT broadcasting standards world over, such as Advanced Television Systems Committee: ATSC(USA), Digital Terrestrial Multimedia Broadcasting: DTMB(China), Digital Video Broadcasting-Terrestrial: DVB-T(Europe) and Integrated Services Digital Broadcasting-Terrestrial :ISDB-T (Japan) focus on stationary reception with home TV sets and high-mounted rooftop antennas. Digital Multimedia Broadcasting (DMB), 1-Seg, DVB-H and DVB-T2 Lite are mobile TV standards. To ensure high visual qualities and to account for the large screen sizes of stationary TV sets, the video signals are compressed and high image resolutions are used. The video formats and bit rates for mobile are different from those required for fixed reception by normal TV. India has adopted DVB-T2 Standard, which is second generation of DVB and has highest data capacity. The DVB-T2 system is an OFDM-based broadcasting standard used not only for stationary reception, but also for mobile applications. Orthogonal Frequency Division Multiplexing is a form of signal modulation that divides a high data rate modulating stream placing them onto many slowly modulated narrowband close-spaced subcarriers and in this way is less sensitive to frequency selective fading. The new DVB-T2 specification provides the facility to select a variety of different options to match the requirements of the network operator. As DVB-T2 offers additional facilities, it will enable the broadcasters the possibility of offering new and captivating services to ensure that they are able to keep their viewers.



Building on the success of the existing digital television services, DVB-T2 is bound to see a significant level of take-up over the coming years.

Some Frequently Asked Questions (FAQ) on DTT are as below:

1. Why is Doordarshan going into digital terrestrial broadcasting?

Doordarshan is transmitting all free-to-air channels in analog format since 15th September 1959. It is necessary to migrate to digital terrestrial broadcasting as the world is moving away from analogue to digital broadcasting. Going digital will provide multiple programme channels, better video and audio quality, provide signals for mobile and portable devices like mobiles/tablets/PC etc. and other value added services, besides it will allow the government to free up frequency spectrum which can be used for new services like mobile, wireless broadband and potentially more TV services and channels.

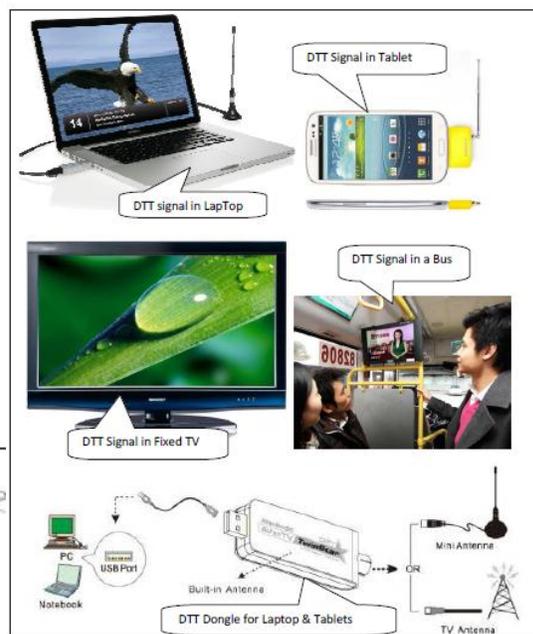
Some advantages of DTT Transmission are as below:

- Analog TV (ATV) is subject to interference, such as ghosting and snow, depending on the distance and geographical location of the TV receiving the signal.
- SDTV pictures are free from "ghosting" and "snowing", which are commonly found in analogue TV pictures.

- c. Digital digital TV supports Standard Digital TV (SDTV) High Definition TV (**HDTV**) and Ultra High Definition TV (**UHDTV**).
- d. DTT secures greater **plurality in Platform ownership**, ensuring that no single platform owner is so powerful that they can exert undue influence on public opinion or political agendas.
- e. The DTT will provide signals for **portable and mobile devices** and also provide signals for Vehicles etc.
- f. The digital transition offers an opportunity to increase the production of local content. This in turn creates job opportunity and increase creativity and entrepreneurship.
- g. **A strong DTT platform is critical to healthy competition in the TV market** and to the realisation of a wide range of social benefits and most essentially an all weather reliable platform and unlike DTH there is no risk of catastrophic failure of total network. It provide alternative distribution platform.
- h. DTT creates the opportunity for convergence . Services like internet, LTE A+ overlay are feasible with DVB T2.

2. How to receive DVB -T2 Signals? Do I need to change my TV set now to receive the DVB -T2 Signal?

It require ordinary antenna (Indoor or outdoor depending upon location of your site) as used in analogue TV. With the existing TV a Set Top Box compliant with DVB T2 Standard is required. But some integrated Digital TVs (iDTV) are available in market having in built set top box. Additional equipment required will be a 75-ohm coaxial cable and a HDMI cable if you are using the DVB T2 set-top box. The pictures illustrates the reception method. The existing analogue TV signals will continue to be broadcast alongside the digital TV signals, for at least another two years until Doordarshan complete the switchover to digital broadcasting. Thus the DTT signals may be received in Laptop,



tablets, Fixed TV and TV receivers and T2 Radio Receivers in fixed and in moving vehicles. The following picture gives a glimpse of receiving equipments:-

3. If one have two TV sets in

his house, will he need two set top boxes?

Yes, if anyone wants to watch two different TV set in one home, and then to view different channels from two TV Sets one would need two STBs. Thus to watch different programmes on multiple TV's in their house, each individual TV will have to be connected to its own set top box.

4. How many TV Programme Channels can we receive from a DTT?

There is a Trade off for broadcaster between Capacity of DTT and its signal robustness/coverage area. Higher data can be achieved but with reduced coverage area and vice versa. Further compression technique is also important. For optimum coverage in MPEG-2 about 7 Standard Definition TV(SDTV) Channels or 2-3 High Definition TV (HDTV) can be relayed and in MPEG-4 about 14 Standard Definition TV(SDTV) Channels or 4-5 High Definition TV (HDTV) can be relayed . It is also possible to relay Radio Channels, Mobile TV etc. Mobile TV require different video format (Resolution and bit rate) compared to Fixed TV. In MPEG 4 about 10 TV Channels may be available for mobile and portable devices. Currently only 5 DD Channels are being relayed.

5. Will Channels other than DD Channels like Star, SAB, Sony etc. be available on DTT? Do I need to pay ,as in case of internet surfing, while watching TV on mobile handset? Can I choose any desired Channel on DTT?

Initially only DD Channels will be available on DTT. Later on ,other than DD Channels may also be available. There will be no charges for receiving TV Channels on DTT using mobile hand set. It will be absolutely free. No recharge

or connection is required. Viewer can watch out of any of those channels only which are being relayed from the DTT Transmitter.

6. In which Cities DTT signal can be received?

DTT Transmitters have been installed in 19 Cities namely - Ahmadabad, Jalandhar, Aurangabad, Kolkata, Bangalore, Lucknow, Bhopal, Mumbai, Chennai, Patna, Cuttack, Raipur, Delhi, Ranchi, Guwahati, Indore, Srinagar, Hyderabad and Thiruvananthapuram. Test transmission in above cities except Srinagar, Hyderabad and Thiruvananthapuram has already been started. In these 3 cities it will start soon. The signal from these Transmitters will be available up to about 60-70 KMs in all directions in fixed mode and 25-30 Kms in mobile mode from the TV Tower. In mobile reception there may be some gaps where signal may not be available at present. DTT Services will be expanded to 64 cities in coming days.

7. Initially how many TV Channels will be available? Will HD Channels will also be available?

Doordarshan will begin with 5 TV Programmes in SDTV namely DD National, DD News, DD Sports, DD Bharati and one Regional channel. Some states either do not have regional channel or are having 3-4 hrs of regional services. In such cities like Delhi, Ranchi and Raipur, DD Kisan will be relayed and at Guwahati DD-North East service will be relayed.

8. Can we receive Radio programmes on DTT? What is T2 Radio?

DVB T2 Transmitter can relay Radio Services in addition to TV Services. It is thus an excellent ecosystem for distribution of TV and Radio Services. The sound quality of T2 Radio is excellent like FM. The programmes may be received in mobile Tv like Video using Dongles or DVB T2 Wi-Fi Dongles. It will not charge any cost for receiving the Radio programmes.



9. Whether market is ready with receiving devices? How do I know if my TV is DVB T2 Ready?

TVs with compatible built-in tuners (Integrated Digital TVs or iDTVs) and set-top boxes are now available world over and in India as well. Dealers have to demonstrate the relevant DTV documents to establish that STB or iDTV offered for sale are capable to receive DVB T2 signals. Some of iDTV models are as below:

SIZE (INCHES)	LG	SAMSUNG	SONY	UV
32	32LF560T 32LF561D 40UF670T	H5570 J5570	KDL-32W700B	
40/42/43	40UF670T 42LF560T 43UF690T 43UF770T 43UF640T	H5570 J5570	KDL-42W700B	40K16

48/49/50	49UF670T 49UF690T 49UF770T 49UF850T 49UF640T	H5570 J5570 JU6470 JU6670 JU6670	KDL-48W600B	N50K310X3D
55	55EC930T 55EG960T 55UF670T 55UF680T 55UF770T 55UF850T 55UF950T	JU6470	KDL-55W950B	N55XT780XWU3D
60/65	60UF850T 65EC970T 65UF770T 65UF850T 65UF950T	JU6470 JU6470		N65XT780XWU3D
75/79/84/98/105	79UF770T 79UF950T 84UB980T 98UB980T 105UC9T			

10. Can DVB-T2 STB receive HD as well as SD?

Yes. the STB, for DVB T2 has a capability to receive/decode any both HDTV and SDTV.

11. What type of antenna can be used for DVB-T2?

You will have to use a UHF antenna to receive DVB-T2 signals which will be broadcast in the UHF channels 21~48 (470~694 MHz). Try to position your UHF antenna for best reception. The reception capabilities of TV antennas vary considerably, so it is

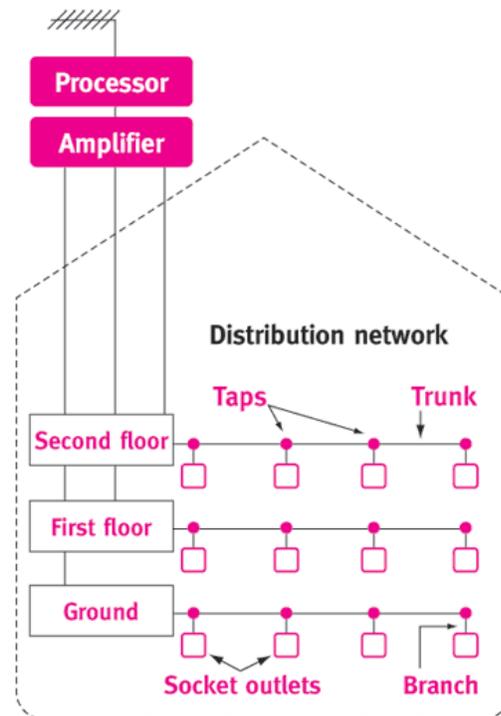


recommended that you consult the retail consultants and look at information on the packaging to make sure that any new antenna you may choose provides good reception of UHF channels. You may improve TV reception by using an active antenna. Active antennas are also available in India. One such vendor's contact detail is: Compatible Power Pvt. Ltd., Vadodara. Email: ushanair111@yahoo.com. Phone: +91-265-6580486. So any type of receiving existing receiving antenna will be sufficient to receive the DTT signal. Mobile dongles have different type of antenna.

12. Can I connect a single antenna to multiple digital receivers?

Splitters can be used to connect a single antenna to multiple digital receivers (IDTV and/or digital set-top box). However, such connections reduce the amount of signal available to each receiver. If you are having problems, check whether reception is improved without the splitter. In some cases, an active splitter that includes an amplifier can solve the problem. MATV stands for Master Antenna Television.

It is the means by which many apartment houses hotels, schools and other multi-unit buildings distribute TV signals to a number of receivers. An MATV system is basically a network of cables and specially designed components that process and amplify TV signals and distribute them from one central location. If there were 100 TV sets in a building, it would be extremely expensive to install and maintain 100 separate antennas. Not only would it be unsightly, but reception would suffer because that many antennas would interact with each other, causing interference problems. A mass of commercial premises including hotels, offices, housing developments and holiday parks, now utilize some form of structured cable system to supply an array of different programmes and information services to their end-user customers. In a typical MATV system the antenna is a conventional TV antenna for TV signals. Signals received by the antenna are then processed. In systems that have not been modified to carry digital, it is usually this processing that restricts or prevents the digital signals from being handled correctly, as the processors are only designed to handle analogue TV signals.



13. How do I place the indoor antenna for best reception?

The location of an indoor antenna is an important factor to have good signal reception. Here are some of the tips on the placement of antenna if you are unable get good reception from its existing location. Try positioning the antenna:

- a. Near a window
- b. At a higher position
- c. Away from other electronic equipment that may introduce interference

For directional antenna, position the antenna facing appropriate window opening, away from area whereby the signal may be blocked.

14. How do I perform tuning?

Make sure your digital TV or set-top-box is connected to an antenna. Tuning may take a few minutes. Every model of digital TV or set-top-box box will be a little bit different. Please refer to the user manual if you are unsure. Here are some general guidelines. Select the 'set up' or 'installation' option. Select digital tuning / Digital TV option. For full tuning, select the auto tuning option. This is somecases called 'auto set-up' or 'first time installation'. Press 'OK' if the digital TV or set-top-box asks if you want to delete all your previous channels. Newly scanned Channels will automatically be stored and you should receive all the free-to-air channels. Unless there is any change from Transmitting end, rescanning may not be required.

15. How do I know if there are subtitles and how can I select the language that I want on my DVB-T2 set or set-top-box?

The availability of subtitles is indicated in the electronic program guide. To select your preferred language, press the 'subtitle' option on your remote control to enable your preferred subtitling language. Most receivers also allow the viewers to pre-set their preferred subtitle languages, providing a control option in selecting primary and secondary subtitling languages. Doordarshan may soon have subtitling facility in Delhi, Mumbai, Chennai and Kolkata initially in 5 languages.

16. Is the quality of DVB-T2 better?

DVB-T2 allows you to receive sound and picture with better quality. The number of television channels broadcasted in DVB-T2 is larger than in analog terrestrial broadcasting. Unlike analog broadcasting, digital terrestrial television has no unwanted "effects" such as "double image" or "snowfall". The picture quality from DTT will remain good till it is not received at all.

17. How many countries have adopted DVB-T/T2 ?

The DVB T/T2 standards have extensively been adopted in Europe, Australia, South Africa, Russia and many Asian Countries. The details may be seen in the following link:

<https://www.dvb.org/news/worldwide>.

18. Can I view DD DTT channels in my vehicle?

Yes, using suitable DVB-T2 Receiver and preferably diversity antenna in the cities where DTT Transmitters are installed. Please also visit youtube at link : <https://www.youtube.com/watch?v=WNnjLpKGBdQ>

19. What is the hardware requirement to watch DTT channels on Mobile phone/tablet?

The mobile should be with USB host function or 'On The Go'(OTG) enabled Android Phone. Any such mobile is capable to transfer data to devices like Pendrive etc. It is always described in mobile specifications. Some examples of such mobile includes: Micromax Q380, Oppo Joy 3 A11W, Intex Power HD, Lava iris X8, Samsung DUOS etc.. More detail in this regard may be seen in DD website <http://www.ddindia.gov.in/Technical/Pages/Digital-Terrestrial-Television.aspx> .DVB-T2 Dongles will be required for attachment to such mobile. Some Wi-Fi Dongles with antenna are also available in market. If such wi-fi dongle with antenna is plugged on power and placed near to window, the signal may be received in mobile/tablet within 20 m from it..



20. How to receive DTT Signals in mobile Phones/Tablets?

One can watch TV on smartphone/Tablet without data charges. The detail procedure is as below:

A. Dongles for Android & Apple Users



Android Users: TV-On-GO Micro USB Dongle (to be used with OTG Enabled Android Smartphone) with mini antenna

Buy at FLIPKART

<http://www.flipkart.com/tvongo-free-tv-otg-dongle-accessory-combo/p/itmexsvmbzg2amr?pid=MACEBXSJVJGAT8TFH&icmpid=recoppsamemobileaccessorymobileaccessoriescombo1&ppid=MACEB7GRWGP4BD82>

Link to Download App

Android Users

<https://play.google.com/store/apps/details?id=kr.co.tvongo.tivizen.darshantvongodvbt2dongle>

< Please open the above link on your android smartphones to install App> **Apple Users**

iOS Version Dongles: Coming soon - Sample available

(For further detail, contact: **DEALER** <dealer@abinnovators.in>)



B. DiGi-Darshan Wi-Fi Router for Android &iOS

Use in your Car (power with USB Charger) with small Antenna

Use at Home/Office(Power with 220V) with small Antenna

and get Wifi-Zone for DVB-T2 for viewing TV Channels on a single device with Android or iOS

Links for online Purchase of Digi-Darshan (Wi-Fi Router for iOS& Android)

i. BUY at FLIPKART



ii. BUY at Ebay

<http://www.flipkart.com/search?q=Digidarshan&as=off&as-show=off&otracker=start> **or**
http://www.flipkart.com/digidarshan-wi-fi-router-dvbt2-receiver-watch-free-tv-accessory-combo/p/itmeb7gry5utq2gg?pid=MACEB7GRWGP4BD82&ref=L%3A1302608290694250570&sno=p_1&query=Digidarshan&otracker=from-search

<http://www.ebay.in/itm/DIGIDARSHAN-WiFi-ROUTER-FOR-FREE-TV-AND-DVB-T2-RECEIVER-/181863170992?>

iii. BUY at Snapdeal

<http://www.snapdeal.com/product/digi-darshan-wifi-router/660598340693#bcrumbSearch:digi%20darshan>

Link to Download App

Link to Download App

For android users

<https://play.google.com/store/apps/details?id=kr.co.digidarshan.tivizen.digidarshandvbt2wifi>

For Apple Users

<https://appsto.re/in/X0A83.i> (Apple iphone users)

21. Contact details for queries on Doordarshan DTT?

In case of a person require any information regarding DTT signal reception, the DD Transmitter Kendra may be contacted. The contact details on are as below:-

CHENNAI	superddkch@yahoo.co.in
BANGALORE	sgeddkbg@gmail.com
MUMBAI	ddkmumen@gmail.com
AURANGABAD	aetvcentre@dataone.in
CUTTACK	hptcuttack@gmail.com
RAIPUR	ddkrai@yahoo.com
KOLKATA	doordarshan_kolkata@rediffmail.com
INDORE	ddindore@yahoo.com
RANCHI	seddkran@rediffmail.com
BHOPAL	ddkbhopal@gmail.com
AHMADABAD	sgeddkahm@yahoo.co.in
PATNA	seddkpatna@yahoo.co.in
GUWAHATI	sgeddk@yahoo.in
LUCKNOW	ddklkosg@rediffmail.com
DELHI	dehpt_ptp@rediffmail.com
JALANDHAR	sge@ddkjal.com
HYDERABAD	sgeddh@yahoo.com
SRINAGAR	sgeddsgr@gmail.com
THIRUVANATHAPURAM	supeddkvm@gmail.com
Doordarshan Directorate New Delhi.	archanagupta.dde@gmail.com msduhan.de@gmail.com
