

# Visualyse Professional User Interface Update

Visualyse Professional has been the tool of choice for study work for the last 25 years, ever since its release at the World Radiocommunication Conference (WRC) in 1995. Much has changed since then, including screen sizes and the power of PCs. To reflect this we've been busy updating the user interface (UI) of Visualyse Professional to enable it to handle large, high resolution, screens. At the same time we've included a host of new features and revised some existing ones, as described in this document.

## What is Visualyse Professional?

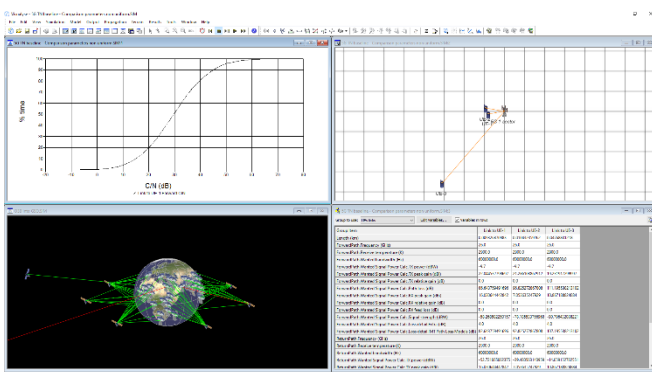
Visualyse Professional is a flexible study tool able to model a very wide range of radiocommunication systems, that can be used to analyse system performance including the impact of interference.

Visualyse Professional is able to model transmit and receive stations located at fixed positions, mobile stations, aircraft, ships and also satellite systems including Earth stations, non-GSO satellites, HEO satellites and GSO satellites.

It is able to be configured to analyse spectrum sharing scenarios using a wide range of methodologies, including static, input parameter variation, area, dynamic, Monte Carlo and combinations such as area Monte Carlo.

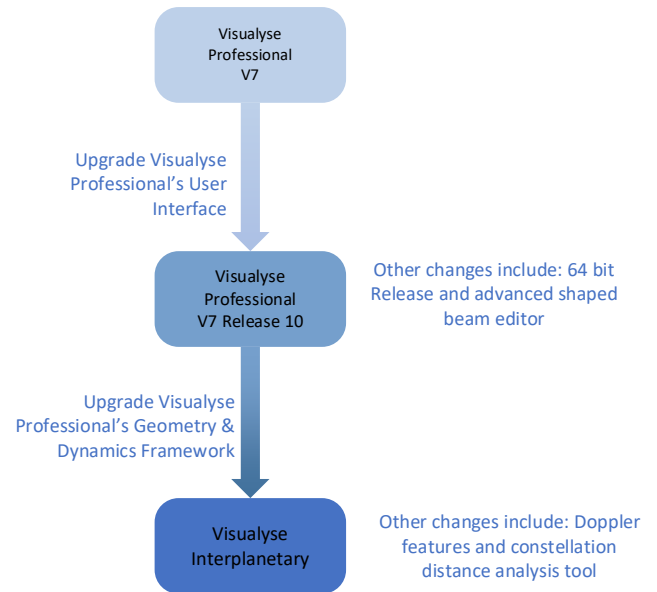
Visualyse Professional includes a wide range of advanced features to enable it to analyse both co-frequency and non-co-frequency scenarios, the impact of terrain or clutter, the impact of traffic and complex handover strategies between satellites. These features allow it to model anything from a 5G network to non-GSO mega-constellations such as SpaceX's Starlink or OneWeb.

An example screenshot of Visualyse Professional is shown below showing a 5G cell and a non-GSO constellation:



## Development Plan

Following feedback from users, we have developed a two stage development plan for Visualyse Professional is shown in the figure below:



The development has been undertaken in two stages, with the intention that existing Visualyse Professional users will migrate to the first stage, described as Visualyse Professional V7 Release 10, that has the advanced user interface and additional features described in this White Paper.

The second stage represents a significant update to the underlying geometry and dynamics framework to allow the modelling of missions to the Moon, Mars and other celestial bodies. This also includes an ellipsoidal Earth model and additional features and is called Visualyse Interplanetary.

More information about Visualyse Interplanetary can be found in a separate White Paper.

## Visualyse Professional 7 Release 10

The prime motivation for this update was to give the user interface a fresh look that would work on a range of screen sizes, from low resolution laptops to large 4K or higher desktops. It was also an opportunity to include a range of new features and options, including:

- An improved tool to create and edit shaped beams used by GSO satellite networks

- Updates of Recommendations, in particular those that define propagation models
- New station icons and flexibility in setting the colours
- Improved charting with updated and integrated controls
- 64 bit operation to allow access to large simulations and terrain data
- additional minor modifications to the software.

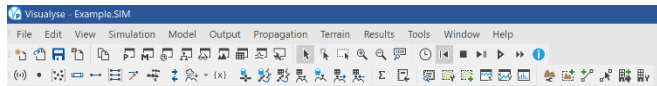
All these changes have been made without any impact on the existing file format, allowing seamless use with the existing version of [Visuallyse Professional](#).

These are described in more detail below.

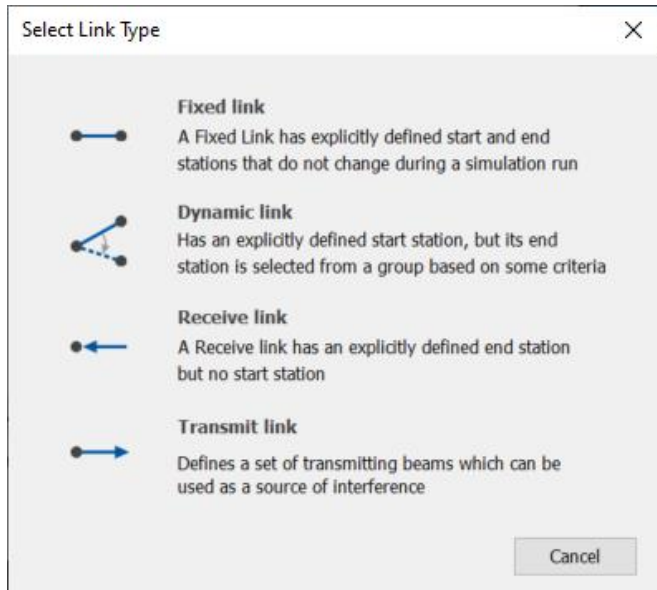
### New User Interface

Building on our experience in developing [Visuallyse GSO V3](#) we have reimplemented every dialog and view in [Visuallyse Professional V7 Release 10](#) to improve its look on all screen sizes and resolutions. This has been achieved by embracing Direct2D technology to utilise the power of modern graphics architecture.

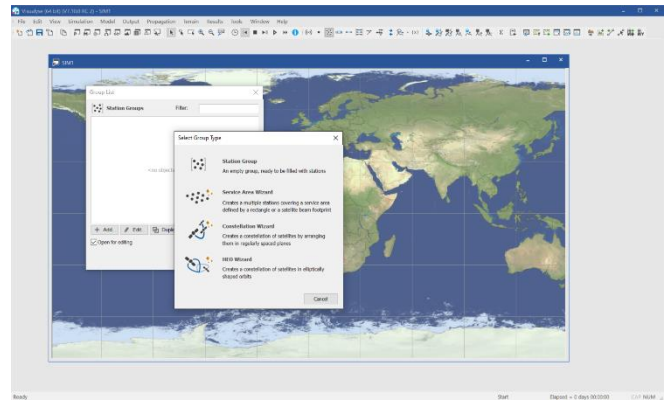
The new design starts with the toolbar which has been updated with a clean design, as shown here:



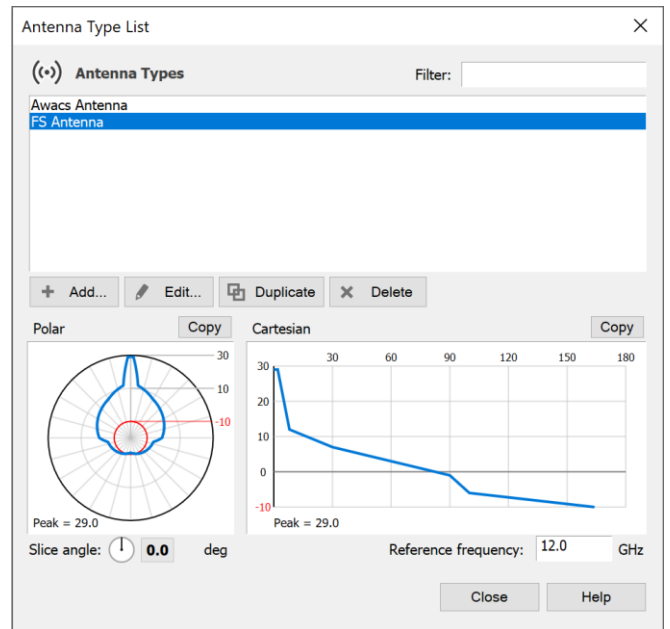
All dialogs have been evaluated and revised to provide a consistent look-and-feel, such as shown here:



The views have also been updated to use this clean design and to automatically re-scale across a range of screen sizes from laptops to 4K monitors:



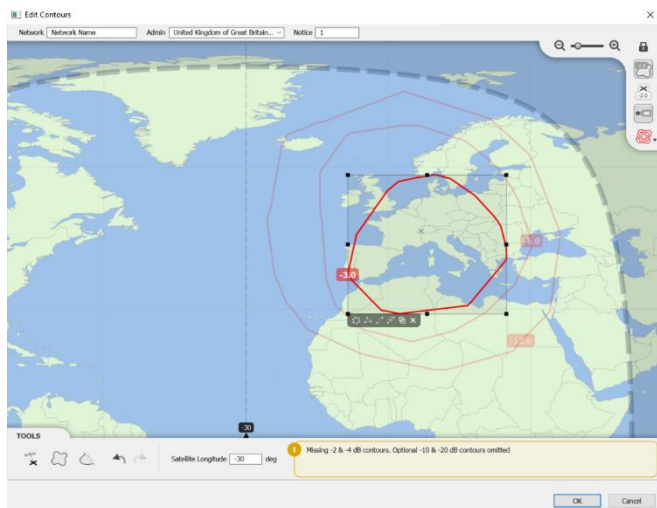
Another example would be the revised antenna type list dialog, as shown below:



### New Shaped Beam Editor

GSO satellite networks can use antennas that have been designed to provide coverage over specific areas of the world, defined using a polygon of (latitude, longitude) points where the relative gain is the same. There is a common format for exchanging this data within ITU-R circles called the GIMS format with extension .GXT.

The editor in [Visuallyse Professional](#) that can be used to create and edit GSO shaped beams has had a significant update following user feedback and now looks like the following:



### Updated Recommendations

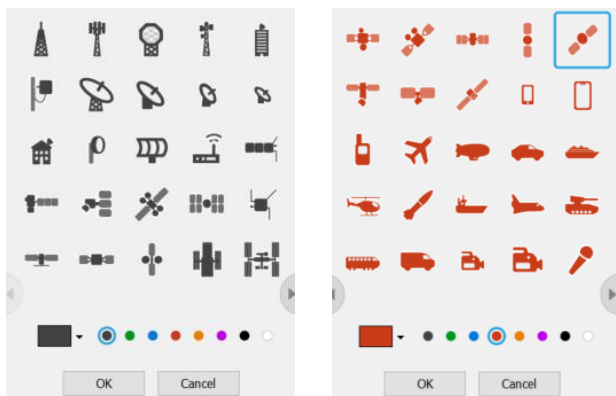
A number of propagation model Recommendations have been updated to the latest versions including:

- Recommendation ITU-R P.453-14
- Recommendation ITU-R P.526-15
- Recommendation ITU-R P.528-4
- Recommendation ITU-R P.530-17
- Recommendation ITU-R P.618-13
- Recommendation ITU-R P.676-12
- Recommendation ITU-R P.840-8
- Recommendation ITU-R P.2001-3

### New Station Icons

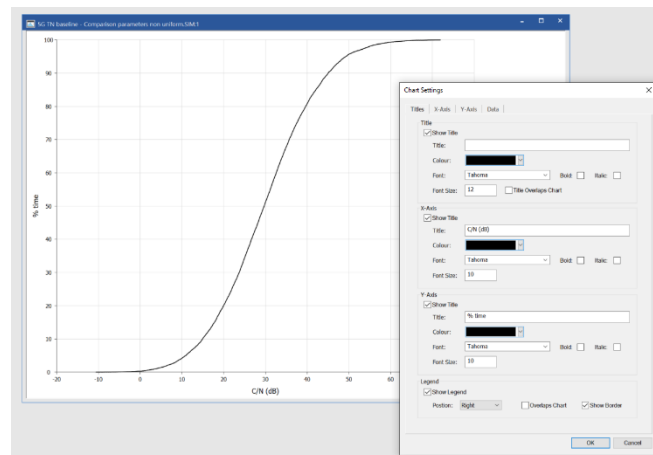
A new set of icons have been developed that are consistent with the new clean styling. These have the additional feature that it is possible to set and change the colour to help distinguish between stations of different networks, for example.

Examples can be seen in the figure below:



### Improved Charting

The charting features have been updated to use the same clean interface as shown in the example below:



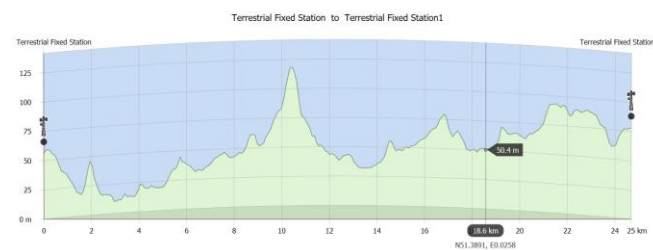
This applies to the:

- Data vs. Time chart
- Data X vs. Data Y chart
- CDF and histogram charts.

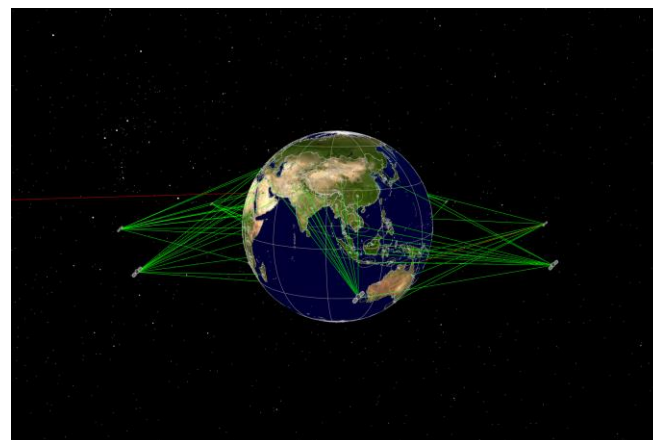
### 64 Bit and Additional New Features

The software has been upgraded to 64 bit and has a number of additional features including:

- Improved Path Profile View as shown below:



- Ability to show stars on the 3D view as in the figure below:



- Option to select EPFD in bandwidths of 40 kHz
- Option to save advanced contours to Google Earth

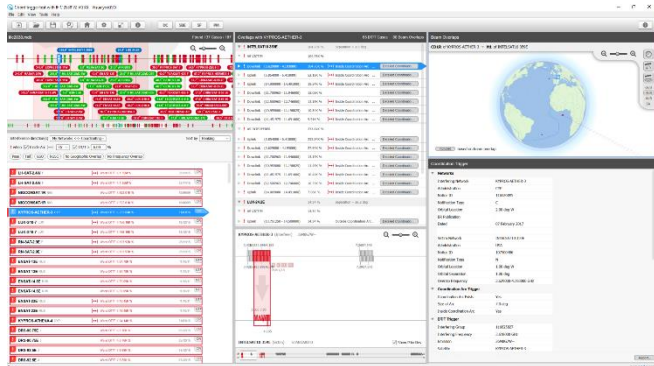
## About Transfinite

We are one of the leading consultancy and simulation software companies in the field of radio communications. As well as [Visualyse Professional](#) we develop and market:

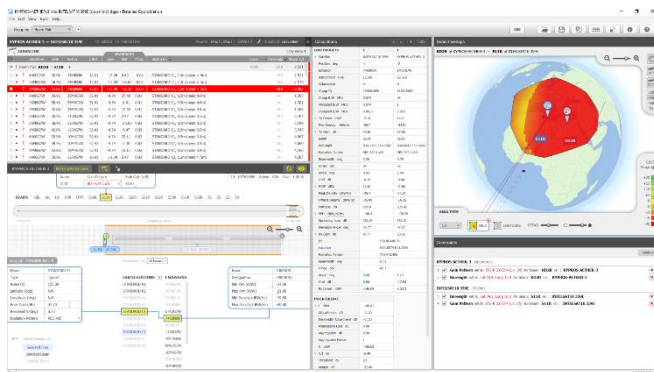
- [Visualyse GSO](#)
- [Visualyse EPFD](#)
- [Visualyse Coordinate.](#)

### Visualyse GSO

We have developed [Visualyse GSO](#) to support satellite coordination tasks, in particular for GSO satellites. It includes IFIC checking, detailed C/I calculations and integrates with ITU databases such as the SRS/IFIC and GIMS. It can be also used to identify coordination requirements of non-GSO satellites.



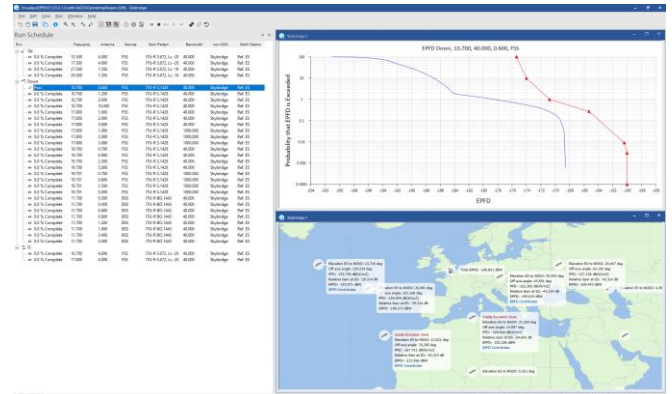
The figure above shows the coordination trigger tool while the figure below shows the detailed coordination tool.



### Visualyse EPFD

Our [Visualyse EPFD](#) software is the leading implementation of the algorithm in Rec. ITU-R S.1503. It has been verified during testing with the ITU BR and can calculate EPFD(up), EPFD(down) and EPFD(IS).

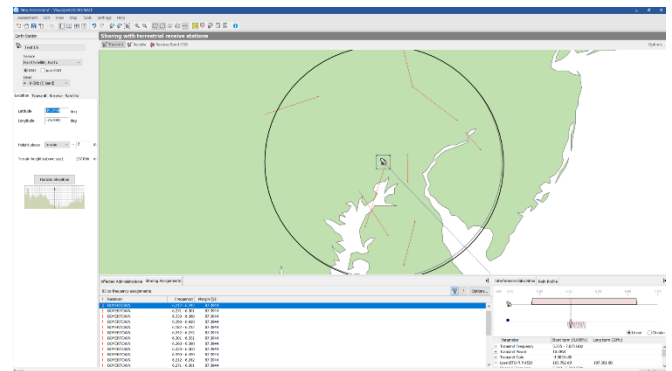
It can also analyse both the Article 22 and Articles 9.7A and 9.7B cases. [Visualyse EPFD](#) has a graphical user interface that provides feedback on the calculation process and allows additional options to be modified.



Additional tools are available to assist in the generation of PFD masks.

### Visualyse Coordinate

We have developed [Visualyse Coordinate](#) to support the coordination of satellite Earth Stations:



### Training Courses and Consultancy Services

We also provide training courses in the use of our products including advanced training that can cover modelling of specific systems and scenarios.

We can provide a wide range of consultancy services using our world-leading experts and software tools to rapidly generate solutions, including:

- Interference analysis and spectrum sharing studies
- Coordination support and meeting representation
- ITU-R and CEPT meeting representation and support
- Strategic consultancy to achieve regulatory goals.

### Contact us

More information about these products and services is available at our web site or email us:

<http://www.transfinite.com>

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*Email us at [info@transfinite.com](mailto:info@transfinite.com) for further information or to give your views on this White Paper*