5.3 Transmitter

Introduction

It can be the ILT or the VLT as illustrated in Figure 146.

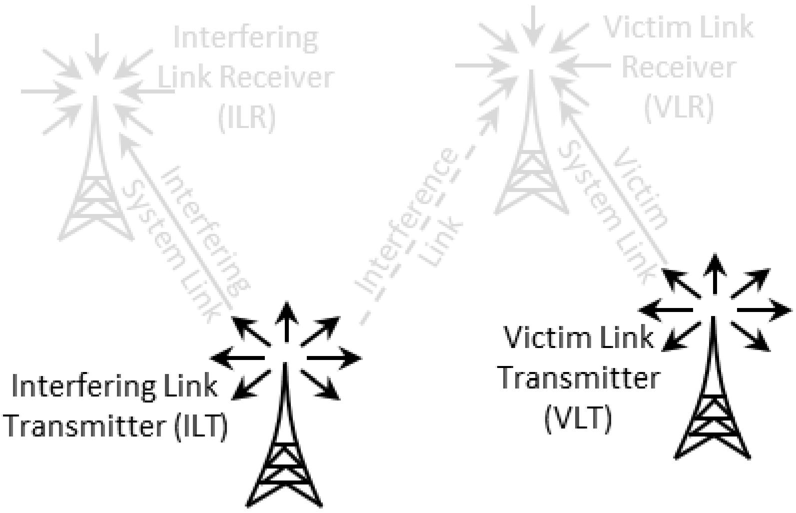

Figure 146: Transmitter illustration as ILT or VLT

It consists in 4 panels (Figure 147); Transmitter identification, antenna pointing, antenna patterns identification, emission characteristics.

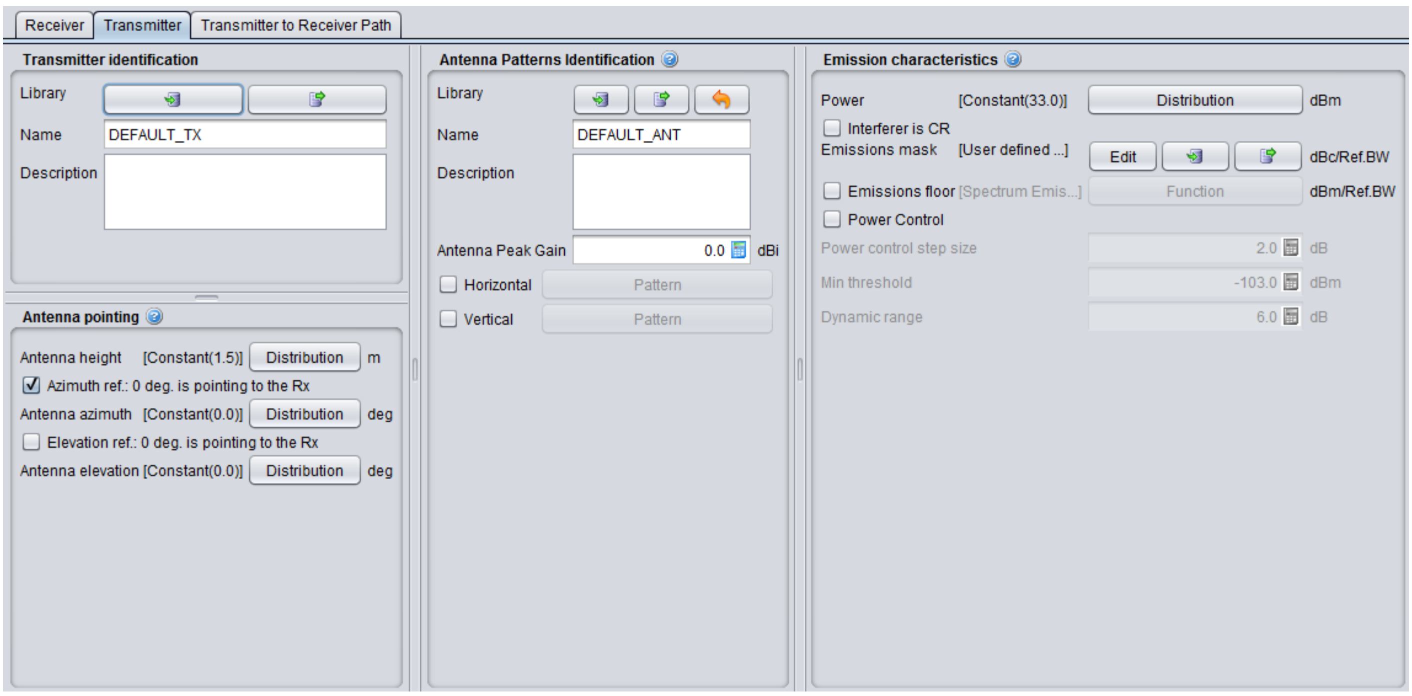

Figure 147: Transmitter GUI

5.3.1 Transmitter identification

This is the same panel as in section 5.2.1 so that transmitter characteristics can be imported/exported from/to the library to/from the workspace and you can freely chose a name and a description.

5.3.2 Transmitter power

In SEAMCAT, the transmitter power (P) is expressed as conducted power in dBm, including feeder loss. The antenna peak gain (G) is expressed in dBi.

Consequently, the power calculated by SEAMCAT at the antenna output is the effective isotropic radiated power (e.i.r.p.) expressed in dBm:

e.i.r.p (dBm) = P (dBm)+G (dBi)

If the transmitter power is defined as e.i.r.p (dBm) or e.r.p (dBm), the conducted power (P), including feeder loss, can be calculated as follows:
P (dBm)= e.i.r.p (dBm)-G (dBi);
P (dBm)= e.r.p (dBm)-G (dBi)+2.15.

If the antenna gain is not known, it should be assumed zero, then:
P (dBm)= e.i.r.p (dBm);
P (dBm)= e.r.p (dBm)+2.15.
Note that G (dBi)= G (dBd)+2.15.

Example 1: P_t= 50 dBm (conducted transmitter power), L_f (feeder loss) = 2 dB, G_{ant} (antenna gain) = 15 dBi
SEAMCAT settings should be: Power (dBm) = 50 - 2 = 48, Antenna Peak Gain (dBi) = 15
e.i.r.p (dBm) calculated by SEAMCAT= P (dBm)+G (dBi) = 48 + 15 = 63 dBm

Example 2: e.i.r.p = 63 dBm, G_{ant} = 15 dBi, feeder loss in not needed
SEAMCAT settings should be: Power (dBm) = 63 - 15 = 48, Antenna Peak Gain (dBi) = 15
e.i.r.p (dBm) calculated by SEAMCAT= P (dBm)+G (dBi) = 48 + 15 = 63 dBm

Example 3: e.r.p = 60.85 dBm, G_{ant} = 12.85 dBd, feeder loss in not needed
SEAMCAT settings should be: Power (dBm)= 60.85 - 12.85 = 48, Antenna Peak Gain (dBi) = 12.85 + 2.15 = 15
e.i.r.p (dBm) calculated by SEAMCAT= P (dBm)+G (dBi) = 48 + 15 = 63 dBm

Example 4: e.i.r.p = 63 dBm, no other information available
SEAMCAT settings should be: Power (dBm) = 63, Antenna Peak Gain (dBi) = 0
e.i.r.p (dBm) calculated by SEAMCAT= P (dBm)+G (dBi) = 63 + 0 = 63 dBm

Example 5: e.r.p = 60.85 dBm, no other information available
SEAMCAT settings should be: Power (dBm) = 60.85, Antenna Peak Gain (dBi) = 2.15
e.i.r.p (dBm) calculated by SEAMCAT= P (dBm)+G (dBi) = 60.85 + 2.15 = 63 dBm

5.3.3 Transmitter antenna pointing

This is the same panel as in section 5.2.1 so that transmitter characteristics can be imported/exported from/to the library to/from the workspace and you can freely chose a name and a description.

5.3.4 Antenna patterns identification

It contains all information relative to the antenna radiation pattern. It is similar to the receiver antenna patterns identification (Section 5.2.3).

5.3.5 Emission characteristics

This panel consists in setting of the emission characteristics of your generic system.

Table 14: Emission characteristics GUI

Description	**Symbol**	**Type**	**Unit**	**Comments**
Power	P	Scalar or Distribution	dBm	This is the transmitter power supplied to the antenna of the generic system, including feeder loss.
Interfere is CR:		Boolean		When the CR button is checked then it allows to set the emission characteristics of the VLT and ILT (used for the sRSS calculation only. See Section 6)
Emission mask:	emission_rel(f)	Function (X,Y) (kHz)	dBc/ reference bandw. (kHz)	Define the mask of the transmitter, in the emission bandwidth and out of the emission bandwidth. It is the unwanted signal level from the ILT. (See ANNEX 7:)
Unwanted emissions floor: Noise floor signal level	emission_floor(f)	Function (X,Y) (kHz)	dBm/ reference bandw. (kHz)	Define the minimum strength of the unwanted emissions. So the unwanted emissions equal to Max(P_{Tx} + Unwanted emission, Unwanted emissions floor) (see Annex A7.4)

Power control				If Power control is checked, the 3 following parameters have to be defined. This Power control is used to limit the output power of the transmitter (see ANNEX 14:)
Power control step size	PC_{step}	Scalar	dB	
Min threshold	$PC_{threshold}$	Scalar	dBm/ emission bandw	If the received power is lower than this threshold, then no power control takes place
Dynamic range	PC_{dyn}	Scalar	dB	If the received power is higher than $Pc_{treshold} + Pc_{dyn}$ then the full power control takes place, i.e. the power is decreased by Pc_{dyn}