

iQ·link[®]

Quick Start Guide v1.32

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1. Introduction

The iQ·link software design focuses on data integrity, to facilitate superior network designs. iQ·link is utilized by multiple domestic and international customers in the designing of over 40,000 operating microwave links where integrity of the data is of utmost importance.

To achieve this high level of data integrity, iQ·link employs a highly relational Oracle database with many built-in integrity checks, to ensure users avoid mistakes. For example, iQ·link will not allow you to assign a 23 GHz antenna to a 7 GHz microwave link design.

For this reason, the initial configuration setup of iQ·link is centered on inputting all the equipment data that is required for link designs. Once the initial setup is complete, designing reliable links is easy and efficient.

The intention of this document is to guide the user on how to launch the application successfully, perform the initial setup of the equipment database and designing the network elements.

For additional aspects of iQ·link, including details on the propagation models that are used, please refer to the iQ·link User Guide.

Need help with setup or anything else?

Contact us at iQlink-Support@comsearch.com. Comsearch is pleased to offer customized WebEx-based support sessions with expert engineers for a low cost of \$495 for up to 4 hours. Support services include, but not limited to:

- Initial setup of radios, antennas, frequency plans, sites and GIS data
- Getting started training
- Advanced training
- Microwave design advice

Additional FREE support is also available 24x7 via our [iQ·link Support & Microwave Design Forum](#). Users will need to register to access the online forum, which contains free tutorial videos in addition to a repository of GIS and Equipment data available to download for free.

2. Outline

The steps below cover the outline of the initial steps from launching iQ·link the first time, to designing your first Microwave Link.

- Create Band/Channels
- Create or Import Radios
- Calculate Interference Objectives
- Create or Import Antennas
- Create Waveguides/Attenuators (optional)
- Create or Import Sites
- Build your first Microwave Link
 - Profile Analysis / Line of Sight check
 - Link Budget (Design) check
 - Interference Analysis
 - Saving your link
- Creating reports

GIS database: minimum requirement to have Digital Terrain Elevation Map, DTEM file(s) to enable creating path profiles. Morphology / Clutter database is also recommended. Using building database, vectors, and maps, satellite images are optional. For detailed information on supported formats please visit the [iQ·link Support & Microwave Design Forum](#).

The iQ·link installation package is shipped with demo databases of equipment: Radios, Antennas, Waveguides, Attenuators, Frequency Plans and other related databases. Installation package also contains site data, pre-planned microwave links and GIS data, which is intended for **demonstration purposes only**.

The demonstration database contains “dummy” data that can be used for trying out the features and functions of iQ·link. This demonstration data should not be used for real microwave link / network planning purposes.

3. Starting the application

Start the iQ-link application by clicking on the Windows start menu and selecting “iQ-link” under the list of programs:



Enter your **User Name** and **Password** and press the **Enter** key.

Default User Name: **link**
Default Password: **pw**

4. Installing the license

To install your license key, please follow the steps below

- 1.) Please launch iQ-link
- 2.) Log in
- 3.) Click OK to close the license warning message
- 4.) On the 'Login' window click on the 'About' button
- 5.) On the 'About' window click on the 'Enter License Key...' button
- 6.) On the 'License DB Interface' window select the line with the host ID shown on the 'About' window
- 7.) Click on the 'Edit' button
- 8.) Paste the license key above to the 'License String' field
- 9.) Click OK to close the 'Edit' window
- 10.) Click OK on the 'Update License Key' warning message
- 11.) Click Cancel to close the 'License DB Interface' window
- 12.) Click OK to close the 'About' window
- 13.) Click Quit to close iQ-link
- 14.) Launch iQ-link and log in again (if previously appeared, the license warning in step 3.) above shouldn't appear, indicating that iQ-link did find a valid license for your system in the destination database)

5. Populating the Equipment Database

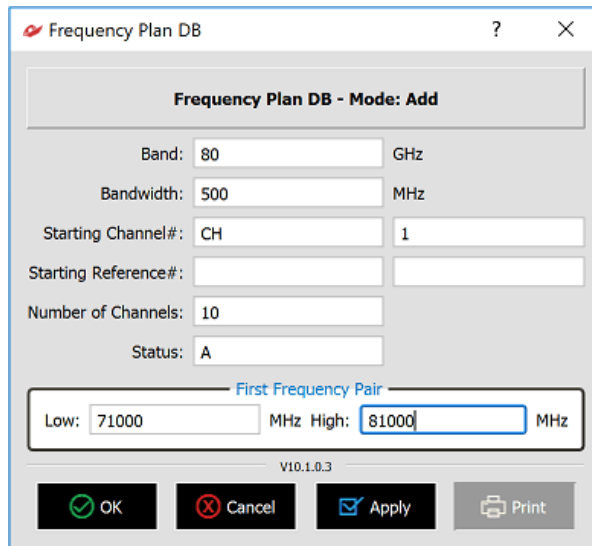
The following sections introduce the main interfaces for the entry of equipment and spectrum data.

5.1. Bands and Channels

In Frequency Plans database you can Add, Edit, View or Delete channels of Frequency Band.



IMPORTANT: When you want to make link plans in a new frequency band you must define channels of new frequency band first.



The above example will add the 80GHz band if it doesn't exist, and 10 frequency pairs, separated by the bandwidth of 500 MHz, with channel numbers starting with CH01 through CH20:

Channel	Low Frequency	High Frequency
CH01	71000	81000
CH02	71500	81500
...
CH10	75500	85500

5.2. Radios

Radios can be entered manually into iQ-link using the Radio Database Interface (Database > Radios) or imported using the Radio Import Utility (Utilities > Radio Import).

NOTE: You may add new Radios into database only in the frequency band defined in the Frequency Plans database described in section 5.1.

On how to import radios into iQ-link, please visit the [iQ-link Support & Microwave Design Forum](#).

5.2.1. Main Radio Details

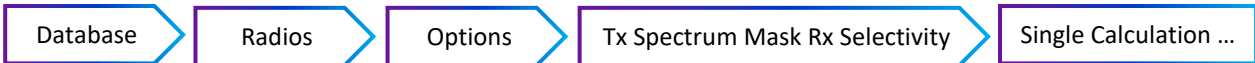


5.2.2. Radio Configuration Options



Configuration	Tx Branching Loss (dB)	Rx Branching Loss (dB)	Config. Type	Number of Channels	MTBF (hours)	Status
1 1+1_A_HSB	1.70	1.70	Hot Standby	1	344300.00	Active
2 1+1_S_HSB	3.50	3.50	Hot Standby	1	344300.00	Active
3 2+0_XPIC	0.00	0.00	None	2	0.00	Active

5.2.3. Radio Tx/Rx Curves



The **Single Calculation** option allows you to import curves, if the Tx and Rx data is provided by the manufacturer, it can be imported from a text file using the **Open** button or press Edit to enter values manually. Alternatively use the **Calculate** button at the bottom of the window to enter ETSI parameters for the system and fill up transmitted spectrum and receiver filter curves. The **Calculate button starts the Calculator**, creates curves based on pre-populated ETSI values. The **Calculator** creates Rx Selectivity curves based on various parameters including the Tx Spectrum Mask limits. Typically, ETSI values are used here, but it is by no means limited to these.

NOTE: If ADM radio is selected, then table of used modulation types is appearing to select modulation type you want to see.

Whilst the **Batch Calculation** creates curves based on pre-populated ETSI values, calculating Tx Spectrum Mask and Rx Selectivity curves in batch mode automatically.

5.2.4. IRF (Interference Reduction Factor) Curves

For accurate interference calculation results, after adding/importing a new radio, the Interference Reduction Factor curves need to be calculated by iQ.link. For that the IRF Objectives interface should be started...



The band needs to be selected...



IRF matrix of selected band shows "X" marks if IRF data exists belonging to a pair of radio types. Radio ID is shown in column and row headers (place mouse over Radio IDs in header to see Radio Model name.)

NOTE: If ADM radio is used, then Modulation ID also displayed ("/" sign used as separator)

By selecting an "X" and click on **Edit** data can be revised and overwritten or single calculation can be performed by clicking Calculate button

Batch Calculation should be launched...



During the Batch Calculation process, iQ.link will check all Radio/Modulation combinations within the selected band, and if finds a combination where no IRF curve is available, but Tx and Rx curves exist, it will calculate the IRF curve automatically.

The screenshot shows the IRF Matrix software interface. The main window displays a grid of radio pairs with 'X' marks indicating IRF data. The 'Selected Band' is 38.00 GHz. An 'IRF Matrix Edit' dialog is open, showing three tabs: 'Tx Spectrum Mask', 'Rx Selectivity', and 'Interference Reduction Factor'. Each tab displays a table of frequency and power/IRF values, a corresponding graph, and radio parameters like Manufacturer, Model, Modulation, Bandwidth, and No. of Points.

NOTE: If you use the C/I Method for evaluating interference objectives, you may use the Radio Import Utility to convert the IRF curves to C/I curves:

On how to convert IRF to C/I curves, please visit the [iQ.link Support & Microwave Design Forum](#).

5.3. Antennas

Antennas can be entered manually into iQ-link using the Antenna Database Interface (Database > Update/Search > Antennas) or imported using the Import Antenna Utility (Utilities > Import Antenna).

On how to use Import antenna utility, please visit the [iQ-link Support & Microwave Design Forum](#).

IMPORTANT: Please make sure to always have pattern data for all 4 polarization combinations (HH, HV, VH, VV)



Required Technical Info

Manufacturer: Andrew
 Model: VHLP2-7W
 Style: Paraboloid
 Gain (dBi): 30.70
 Band (GHz): 7.00
 Min.Freq. (MHz): 7125.00
 Max.Freq. (MHz): 8500.00
 3 dB BW (Degrees): 4.700
 Diameter (m): 0.600
 Length (m): Width:

General Info

Status: Active
 Performance: High
 Mounting: Both
 Approval Number:
 Gov't Apprv. Number:
 Antenna Type:
 Electrical Tilt: 0.000 Up Down
 Q Factor (0-99 dB): 0.000
 Type Approval: No
 Comments:
 Revision Number: NSMA WG16.99.050
 Front to Back Ratio: 57.0
 Manufacturer Diagram Number: 7075A

Pattern Info

Polarization: HH Plane: AZ
 Pattern Date: 10 January 2007
 Created: 4 May 2011
 Last Update: 4 May 2011
 Comments: iQ-link pattern number: 313

Reference Gain Discrimination

	Angle	Gain	Discrimination
1	0.00	30.70	0.00
2	0.50	30.70	0.00
3	1.00	30.47	0.23
4	1.50	30.00	0.70
5	2.00	29.40	1.30
6	2.50	28.54	2.16
7	3.00	27.45	3.25
8	3.50	26.33	4.37
9	4.00	24.90	5.80
10	4.50	23.18	7.52
11	5.00	21.20	9.50
12	5.50	19.01	11.69
13	6.00	16.04	14.66
14	6.50	12.70	18.00

Buttons: New, Edit, Delete, Symmetry, Pattern

Version: V10.1.0.3

Buttons: OK, Print

In Pattern Info tab HH, HV, VH, VV patterns can be selected by clicking Polarization drop down box.

In this tab Elevational antenna patterns also can be entered or viewed by using Plane drop down box. If Elevational antenna characteristics are not filled up, then iQ-link will be using the default Azimuthal patterns instead of Elevational by 3D antenna pattern calculations of Interference Analysis.

By using Pattern button selected antenna pattern can be viewed.

5.4. Waveguides



The screenshot shows a software window titled 'Waveguide Module' with a close button (X) and a help button (?). The main content area is titled 'Waveguide DB Module - Mode: Edit'. It contains the following fields:

- Id:** 2
- Model:** PBR 220/UBR220/ #9425UXI103
- Manufacturer:** RFS
- Band:** 26.00 GHz
- Attenuation:** 120.00 dB/100m
- Type:** (empty text field)
- Diameter:** 1.60 cm
- Min. Length:** 0.60 m
- Max. Length:** 0.60 m
- Status:** Active

At the bottom right, there is a version number 'V10.1.0.3' and four buttons: 'OK', 'Cancel', 'Apply', and 'Print'.

5.5. Attenuators



The screenshot shows a software window titled 'Attenuator Module' with a close button (X) and a help button (?). The main content area is titled 'Attenuator DB Module - Mode: Edit'. It contains the following fields:

- ID:** 7
- Model:** Fixed 10dB
- Manufacturer:** Alcatel
- Band:** 15.00 GHz
- Attenuation:** 10.00 dB
- Type:** fixed
- Status:** Active

At the bottom right, there is a version number 'V10.1.0.3' and four buttons: 'OK', 'Cancel', 'Apply', and 'Print'.

6. Creating Network Elements

6.1. Sites

Sites can be entered manually into iQ-link using the Site Database Interface (Database > Update/Search > Sites) or imported using the Import Site Utility (Utilities > Import Site).

On how to import sites into iQ-link, please visit the [iQ-link Support & Microwave Design Forum](#).

IMPORTANT: Please make sure to have reference base of site coordinates on the same ellipsoid like the GIS data, for accurate overlay.



Site Database Interface - Change

Site ID: Class: Site Site-In-Progress

Site Location Id:

Site Name:

Gov't Approval #:

Gov't Approval Status: Approved Unapproved None

Latitude/Longitude

Latitude:

Longitude:

Alternate

UTM Zone: UTM

Northing: Hemisphere: Northern Southern

Easting:

Grnd Elev: m

Structure Height: m

Mean Time to Repair: Hours

Description | Display | PMP

Owner:

Street/Ground Area:

Zip Code and City:

Country:

Site Type:

Site Comment 1:

2:

V10.1.0.3

NOTE: Mandatory fields for a site are the ID, Name and a set of coordinates (labeled in bold). If you leave ground elevation empty, or set it to 0, the ground elevation will be automatically determined from the GIS data at the given location.

6.2. Links

Links are Created in iQlink with the help of the Main Engineering Window...



Here are the basic steps: Select/apply the end Sites, select the Band, choose the required radios and antennas (optionally waveguides and attenuators).

NOTE: Channels don't need to be pre-selected, when the link is created. Interference Analysis will help to select an interference free channel at a later stage.

Main Engineering (V10.10.2)

DEMO1-1 + LAG Details

File Profile... Design... Interference Details Recalc/Auto

Sites

Location ID:	VS3568	VS0002
Site ID:	VS3568	VS0002
Name:	Schüttaustraße 52	Vienna 02
Gov't Approval #:		
Structure Height:	35.00 m	35.00 m
Lat Lon:	48-13-38.3 N 16-25-19.0 E	48-12-37.5 N 16-26-9.6 E
UTM Zone:	N E: 33: 5342542.7 605603.1	33: 5340684.5 606681.6
Azimuth:	150.93 Deg	330.94 Deg
Tilt:	0.22 Down	0.21 Up

Length / TPL: 2.15 km / 130.92 dB

Band: 38.00 GHz Frequency Assignment: Paired Unpaired

Radios

Radio	Model_38G14M_21-90M	Model_38G14M_21-90M
Capacity/Modulation:	90.00 Mb/s / 256QAM ^{ADM} 1+1_A_HSB	90.00 Mb/s / 256QAM ^{ADM} 1+1_A_HSB
Power:	15.00 6.60 dBm	15.00 6.60 dBm
Branching Loss:	Tx: 1.70 dB Rx: 1.70 dB	Tx: 1.70 dB Rx: 1.70 dB
Frequency Plan:	High Low	Low High

Channels

ID	REF	FREQ	Pol	T
C28	C28	37443	V	P
C28	C28	38703	V	P

Antennas

Main Ant.	VHLP1-38	VHLP1-38
Gain:	40.11 dBi	40.11 dBi
Height:	35.00 m AGL	35.00 m AGL
Lat/Lon:	48-13-38.3 N/16-25-19.0 E	48-12-37.5 N/16-26-9.6 E
EIRP:	53.41 45.01 dBm	53.41 45.01 dBm
Diversity Ant.:		
Gain:	dBi	dBi
Height:		

Waveguides

Waveguide	NIL	NIL
Total Length:		
Total Loss:	dB	dB

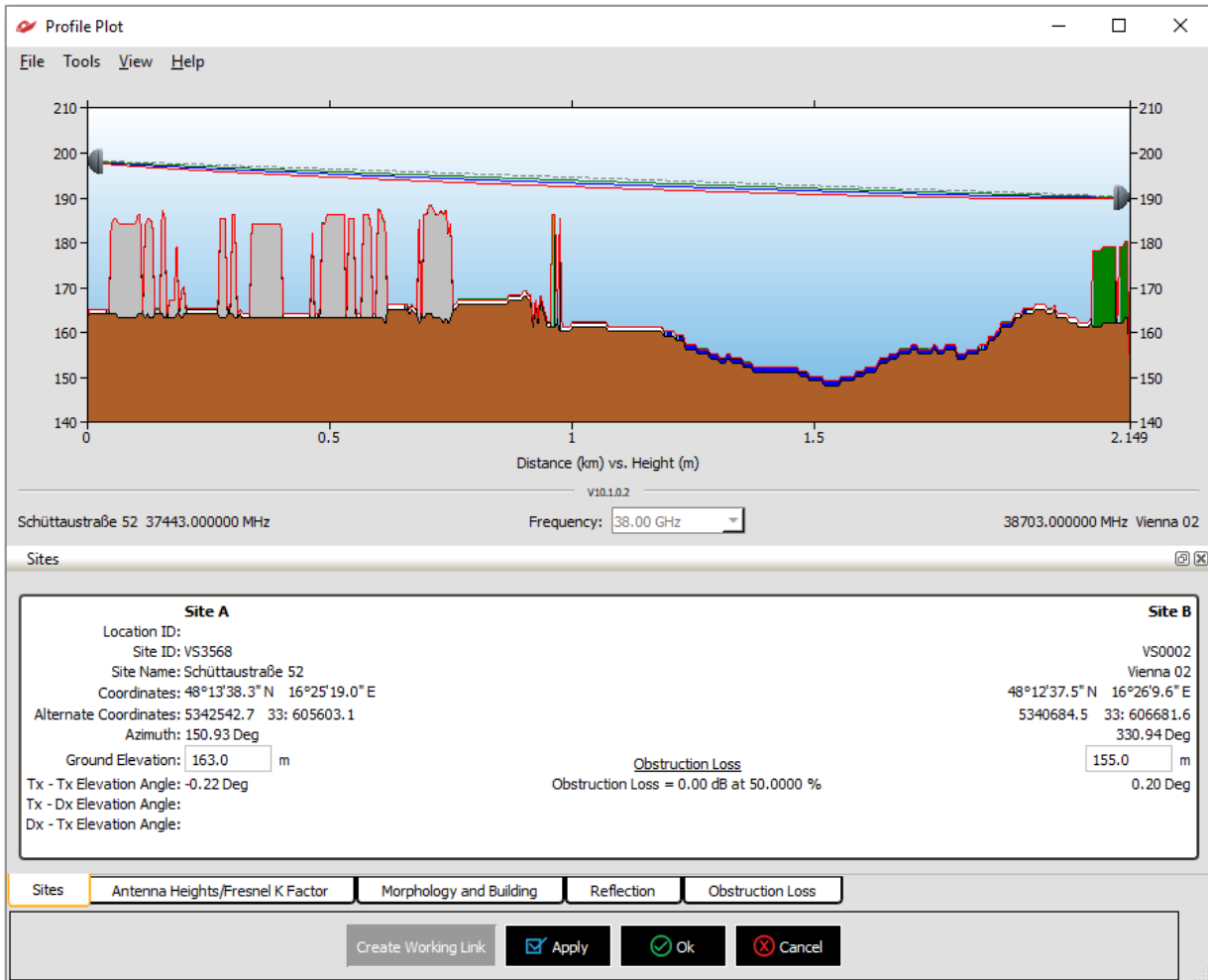
Attenuators

Attenuator	NIL	NIL
Common Tx Rx Loss:	dB dB dB	dB dB dB
Other Losses:	0.00 dB	0.00 dB

Region: Austria ID: DEMO1-1 Working Created By: Henrik

6.2.1. Profile Analysis

Main Engineering Profile...



In Profile Menu antenna heights can be optimized, terrain and morphology data revised or modified. Reflection and Anti-Correlation analysis for Space Diversity system design can be performed.

6.2.2. Design (Outage/Unavailability Prediction)



The screenshot shows the 'Design' window with the following sections:

- Link Budget:** Includes Site A (VS3568 / Schüttustraße 52) and Site B (VS0002 / Vienna 02) details, such as Primary/Div/ATPC RSL, Threshold/ACM Drop Level, and Composite Fade Margin.
- Rain:** Includes Rain Rate Method (ITU-R P.837-7), Rain Rate (28.8 mm/hr), and Polarity (Vertical).
- Diversity:** Includes XPD settings, Frequency Diversity, and Improvement Factors.
- Multipath:** Includes Geoclimatic (15260.304 x 10⁻⁸), Roughness (1.00), Climate (1.00), and Avg Ann. Temp (10.00 °C).
- Prediction Results:** A table showing Unavailability, Uptime(%), Downtime(%), Downtime(sec), and Downtime(sec/km) for various conditions.

Unavailability:	Uptime(%)	Downtime(%)	Downtime(sec)	Downtime(sec/km)
Outage:				
Flat	99.999995	0.000005	1.43	0.66
Selective	100.000000	0.000000	0.00	0.00
Total Outage	99.999995	0.000005	1.43	0.66
Unavail. + Outage	99.996815	0.003185	1004.28	467.31

6.2.2.1 Propagation Models

- ITU-R P.530-6 through to ITU-R P.530-17
- Vigants
- Galuner

The newest reliability model is the P.530-17 model. This does not require any user input while determining the value of the geoclimatic factor. To find the proper geoclimatic factor for the earlier versions of the P.530 reliability model, the geoclimatic Factor Calculator may be used. Setting the default value of the geoclimatic factor is possible in the System Administration Utility (Utilities > Sys Admin).

NOTE: For different versions of the P.530 recommendation series the value and definition of the geoclimatic factor is also different.

6.2.2.2 Objective Models

For link performance calculation following Objective Models can be selected from drop down box:

- ITU-T G.826
- ITU-T G.821
- General

Interference Analysis



iQ-link supports two Interference Calculation Methods, which need to be pre-selected in the System Administration Utility.

The IRF method uses interference reduction factor calculated by iQ-link from the Tx Spectrum Mask / Rx Selectivity curves of the radio, to normalize all interference to co-channel, then to determine the Threshold Degradation of the victim based on the noise increase.

The C/I method compares the calculated T/I (when carrier faded to Threshold) against the objective provided by the manufacturer of the victim radio, depending on the frequency separation. If the calculated T/I is missing the objective provided by the manufacturer, the case is reported.

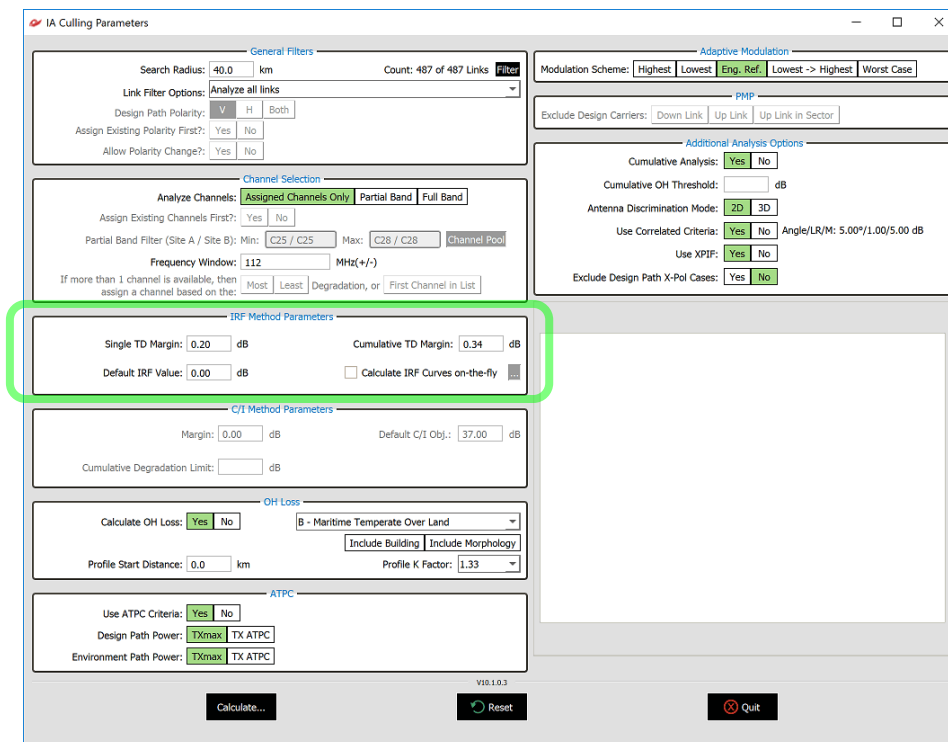
It is recommended to use the method which is also used by the regulator of the country the link is designed in.

6.2.2.3 IRF Method

6.2.2.3.1 Analysis Parameters

Set and select the appropriate parameters for the interference analysis.

NOTE: Please pay attention to all the calculation parameters, in particular the Search Radius (Coordination distance), as this has a dramatic affect on the results. For more information on this and the rest of the options below, please refer to the [iQ-link Support & Microwave Design Forum](#) for further details.



6.2.2.3.2 Analysis Summary

With the *Full Band* option selected as *Search Frequency* on the window above, after completing the analysis, the *summary* window below will list all channels available for the radio, with the number of interference cases into and from each end.

To select an interference free channel, just choose a line where the *Number of Cases* is 0 for both ends and click *Assign Frequency*.

Design Path Details

Site ID / Location ID: VS3568 / VS0002 /
 Site Name: Schüttaustraße 52 / Vienna 02
 Latitude Longitude: 48-13-38.3N 16-25-19.0E / 48-12-37.5N 16-26-9.6E
 UTM Zone: N E: 33: 5342542.7 605603.1 / 33: 5340684.5 606681.6
 Gnd Elev & Length: 163.00 m / 2.15 km / 155.00 m
 Path Azimuth: 150.93° / 330.94°

Radio Model: Model_38G14M_21-90M / Model_38G14M_21-90M
 Capacity / BW / Mod.: 90 Mb/sec / 14 MHz / /Z56QAM / 90 Mb/sec / 14 MHz / /Z56QAM
 Power: 15.00 dBm / 15.00 dBm
 Channel / Frequency: NIL / N/A / NIL / N/A

Antenna Model / Hgt.: VHLP1-38/35.00 mAGL / VHLP1-38/35.00 mAGL
 Antenna Coordinate: 48-13-38.3N 16-25-19.0E / 48-12-37.5N 16-26-9.6E
 33: 5342542.7 605603.1 / 33: 5340684.5 606681.6

Waveguide Loss: 0.00 dB / 0.00 dB
 Free Space / Abs. Loss: 130.69 dB / 0.23 dB
 RSL / Threshold: -39.17 dBm/-64.50 dBm / -39.17 dBm/-64.50 dBm

Channel Summary

Channel Number	Number of Cases	Number of Paths	Cumulative into Site A (dBm)	Channel Number	Number of Cases	Number of Paths	Cumulative into Site B (dBm)
1 C25	0	0	-148.75	1 C25	0	0	-140.78
2 C26	0	0	-151.23	2 C26	1	1	-136.16
3 C27	0	0	-141.67	3 C27	0	0	-136.69
4 C28	0	0	-139.30	4 C28	0	0	-130.71
5 C29	0	0	-160.03	5 C29	0	0	-156.85
6 C30	0	0	-174.58	6 C30	0	0	-163.19
7 C31	0	0	-164.73	7 C31	0	0	-163.87
8 C32	0	0	-147.11	8 C32	0	0	-150.15

Frequency Assignment: Paired Unpaired Only Preferred Channel(s) Include OH Loss: Yes No
 Channel Polarity: Vertical Horizontal Show Excluded Links: Yes No

Buttons: Assign Frequency, Summary Report..., Case Details..., Cumulative Details..., Cancel

6.2.2.3.2.1 Case Details

Further details of the interference cases are also available.

Environment Path Details

Site ID / Location ID: 53795/ 53812/
 Site Name: Muthg. 56-64 / 20. Brightenauer Lände 224
 Latitude Longitude: 48-14-53.0N 16-21-35.0E / 48-14-41.0N 16-22-12.0E
 UTM Zone: North East: 33: 5344764.8 600940.9 / 33: 5344407.9 601710.5
 Gnd Elev & Length: 178.00 m / 0.85 km / 158.00 m
 Path Azimuth: 115.90° / 295.90°

Radio Model: UX - 38 - 7 - 4QAM - 4x2 / UX - 38 - 7 - 4QAM - 4x2
 Capacity / BW / Mod.: 4x2 Mb/sec / 7 MHz / /4QAM / 4x2 Mb/sec / 7 MHz / /4QAM
 Power: 15.00 dBm / 15.00 dBm
 Channel / Frequency: B56 / /38706.5H MHz / B56 / /37446.5H MHz

Antenna Model / Hgt.: SB1-380 (Gain: 0.00 dBi) / 25.00 mAGL / SB1-380 (Gain: 0.00 dBi) / 56.50 mAGL
 Antenna Coordinate: 48-14-53.0N 16-21-35.0E / 48-14-41.0N 16-22-12.0E
 33: 5344764.8 600940.9 / 33: 5344407.9 601710.5

Waveguide Loss: 0.00 dB / 0.00 dB
 Free Space / Abs. Loss: 122.62 dB / 0.09 dB / -137.04 dBm / -79.00 dBm
 RSL / Threshold: -137.04 dBm / -79.00 dBm

Calculation Results

Include OH Loss: Yes No Exclude Environment Link in Future Analyses

Interference Calculation	Radio Modulation	OH Loss (dB)	Loss Type	FSPL (dB)	Int Level (dBm)	S. TD Calc (dB)	S. TD Obj (dB)	C. TD Calc (dB)	C. TD Obj (dB)
A->D	(32QAM)->(4QAM)	115.56	ITU	138.31	-270.93	0.00 (CORR)	1.00	N/A	3.00
D->A									
B->C									
C->B									

Buttons: Next Path, Prev. Path, Next Channel, Prev. Channel, Update Design, Quit, Print

Design Channel A: C26/37415 B: C26/38675 Interfering Path 1 of 18 1886-1 Primary

If the **calculated** Single or Cumulative Threshold **Degradation exceeds** the predefined **objective**, the case is reported as an interference case.

6.2.2.3.2.1.1 Cumulative Details

The Cumulative Details shows the list of links contributing to the cumulative threshold degradation.

Site A: Schüttaustraße 52 (L)		Site B: Vienna 02 (H)		Free Space Loss A (dB)	C/I Calc A (dB)	OH Loss A (dB)	Loss Type A
Link Id	Interfering Link	Channel / Pol					
1	DEMO2	Schüttaustraße 52 (L) - Vienna 02 (H)	C28V - C28V	130.69	30.09	0.00	ITU
2	DEMO1	Schüttaustraße 52 (L) - Vienna 02 (H)	C28V - C28V	130.69	39.98	0.00	ITU
3	981	Gebhardgasse 8 (L) - BSC TGM Wexstr. (H)	B54H - B54H	136.12	121.12	*	N/C
4	5088	22_Pirquetgasse (H) - BSC Skrabalg, Fernwärme (L)	B54H - B54H	137.76	65.18	*	N/C
5	5258	Korneuburg Nord (L) - KW Korneuburg (H)	B54V - B54V	146.39	121.20	*	N/C
6	1147	Floridusg. 46 (L) - Wagramerstraße 21 (H)	A99H - A99H	122.45	143.65	*	N/C
7	4919	Nottebohmstraße 4 (L) - BSC TGM Wexstr. (H)	B53V - B53V	136.12	104.12	*	N/C
8	1628	Wagramerstraße 21 (H) - Siemensstr. (L)	B54V - B54V	122.45	90.93	*	N/C
9	511	Meierstraße (H) - 3_Hainburgerstraße 33 (L)	B53V - B53V	130.82	89.72	*	N/C
10	2437	21_Gerstgasse 12 (H) - Kommunikationsplatz 1 (L)	B54H - B54H	138.21	121.15	*	N/C
11	884	Schüttaustraße 52 (L) - Mexicoplatz 24 (H)	B55H - B55H	127.51	80.69	*	N/C
12	5430	3_Ungargasse 10 (L) - Donaaturm (H)	A105V - A105V	128.64	81.27	*	N/C
13	1424	Erzberggasse 60 - 74 (L) - Donauturm (H)	B54H - B54H	130.60	110.17	*	N/C

Cumulative Summary			
C/I Obj (A/B):	36.34 / 36.34 dB	C/I Calc (A/B):	35.66 / 35.54 dB
FKTB (A/B):	-94.97 / -94.97 dBm	FKTB Margin A:	5.19 dB
Threshold(A/B):	-64.50 / -64.50 dBm	Degradation A:	1.15 dB
		Int Level (A/B):	-100.16 / -100.04 dBm
		FKTB Margin B:	5.07 dB
		Degradation B:	1.18 dB

6.2.2.4 C/I Method

6.2.2.4.1 Analysis Parameters

Set and select the appropriate parameters for the interference analysis.

NOTE: Please pay attention to all the calculation parameters, in particular the Search Radius (Coordination distance), as this has a dramatic affect on the results. For more information on this and the rest of the options below, please refer to the [iQ-link Support & Microwave Design Forum](#) for further details.

The screenshot shows the 'IA Culling Parameters' dialog box with several sections:

- General Filters:** Search Radius: 40.0 km, Count: 486 of 486 Links. Link Filter Options: Analyze all links. Design Path Polarity: V, H, Both. Assign Existing Polarity First?: Yes/No. Allow Polarity Change?: Yes/No.
- Adaptive Modulation:** Modulation Scheme: Highest, Lowest, Eng. Ref., Lowest -> Highest, Worst Case.
- Channel Selection:** Analyze Channels: Assigned Channels Only, Partial Band, Full Band. Assign Existing Channels First?: Yes/No. Partial Band Filter (Site A / Site B): Min: C25 / C25, Max: C28 / C28, Channel Pool. Frequency Window: 112 MHz(+/-). If more than 1 channel is available, then assign a channel based on the: Most, Least, Degradation, or First Channel in List.
- IRF Method Parameters:** Single TD Margin: 0.20 dB, Cumulative TD Margin: 0.34 dB, Default IRF Value: 0.00 dB, Calculate IRF Curves on-the-fly: [checkbox].
- C/I Method Parameters (highlighted):** Margin: 0.00 dB, Default C/I Obj.: 37.00 dB, Cumulative Degradation Limit: [input].
- OH Loss:** Calculate OH Loss: [Yes/No], Profile Start Distance: 0.0 km, Profile K Factor: 1.33.
- ATPC:** Use ATPC Criteria: [Yes/No], Design Path Power: TXmax, TX ATPC, Environment Path Power: TXmax, TX ATPC.

6.2.2.4.2 Analysis Summary

With the *Full Band* option selected as *Search Frequency* on the window above, after completing the analysis, the *summary* window below will list all channels available for the radio, with the number of interference cases into and from each end.

To select an interference free channel, just choose a line where the *Number of Cases* is 0 for both ends and click *Assign Frequency*.

Interference Analysis

Design Path Details

Site ID / Location ID: **VS3568** / **VS0002**
 Site Name: **Schütttaustraße 52** / **Vienna 02**
 Latitude Longitude: 48-13-38.3N 16-25-19.0E / 48-12-37.5N 16-26-9.6E
 UTM Zone: N E: 33: 5342542.7 605603.1 / 33: 5340684.5 606681.6
 Gnd Elev & Length: 163.00 m / 2.15 km / 155.00 m
 Path Azimuth: 150.93° / 330.94°
 Radio Model: **Model_38G14M_21-90M** / **Model_38G14M_21-90M**
 Capacity / BW / Mod.: 90 Mb/sec / 14 MHz / 256QAM / 90 Mb/sec / 14 MHz / 256QAM
 Power: 15.00 dBm / 15.00 dBm
 Channel / Frequency: **NIL** / **N/A** / **NIL** / **N/A**
 Antenna Model / Hgt.: **VHLP1-38**/35.00 mAGL / **VHLP1-38**/35.00 mAGL
 Antenna Coordinate: 48-13-38.3N 16-25-19.0E / 48-12-37.5N 16-26-9.6E
 33: 5342542.7 605603.1 / 33: 5340684.5 606681.6
 Waveguide Loss: 0.00 dB / 0.00 dB
 Free Space / Abs. Loss: 130.69 dB / 0.23 dB
 RSL / Threshold: -39.10 dBm/-64.50 dBm / -39.10 dBm/-64.50 dBm

Channel Summary

Channel Number	Number of Cases	Number of Paths	Channel Number	Number of Cases	Number of Paths
1 C25	0	0	1 C25	2	1
2 C26	0	0	2 C26	0	0
3 C27	0	0	3 C27	1	1
4 C28	0	0	4 C28	2	2
5 C29	1	1	5 C29	0	0
6 C30	0	0	6 C30	0	0
7 C31	0	0	7 C31	0	0

Frequency Assignment: Paired Unpaired Only Preferred Channel(s) Include OH Loss: Yes No
 Channel Polarity: Vertical Horizontal Show Excluded Links: Yes No

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Assign Frequency Summary Report... Case Details... Cancel

You can choose between the *Case Details* and *Cumulative Details* by clicking on the appropriate button at the bottom of this screen.

6.2.2.4.2.1 Case Details

Further details of the interference cases are also available.

Interference Case Details
— □ ×

Environment Path Details

Site ID / Location ID: S3767/ Site Name: Floridusg. 46 Latitude Longitude: 48-15-0.0N 16-24-43.0E UTM Zone: North East: 33: 5345050.9 604813.6 Gnd Elev & Length: 156.00 m 1.83 km Path Azimuth: 157.27° Radio Model: UX - 38 - 3.5 - 4QAM - 2x2 Capacity / BW / Mod.: 2x2 Mb/sec / 3.5 MHz / 4QAM Power: 15.00 dBm Channel / Frequency: A99 / 37402.75H MHz Antenna Model / Hgt.: SBI-380 (Gain: 39.60 dBi) / 30.00 mAGL Antenna Coordinate: 48-15-0.0N 16-24-43.0E 33: 5345050.9 604813.6 Waveguide Loss: 0.00 dB Free Space / Abs. Loss: 129.31 dB / 0.20 dB RSL / Threshold: -55.31 dBm / -82.00 dBm	S3572/ Wagramerstraße 21 48-14-5.2N 16-25-17.3E 33: 5343373.4 605552.8 157.00 m 337.28° UX - 38 - 3.5 - 4QAM - 2x2 2x2 Mb/sec / 3.5 MHz / 4QAM 15.00 dBm A99 / 38662.75H MHz SBI-380 (Gain: 39.60 dBi) / 58.00 mAGL 48-14-5.2N 16-25-17.3E 33: 5343373.4 605552.8 0.00 dB -55.31 dBm / -82.00 dBm
---	--

Calculation Results

Include OH Loss: Yes No Exclude Environment Link In Future Analyses Prev. More

Interference Calculation	Radio Modulation	OH Loss (dB)	Loss Type	FSPL (dB)	Int Level (dBm)	C/I Calc (dB)	Int Obj	Int Mode	Margin (dB)	S.
A->D										
D->A										
Profile B->C	(256QAM)->(4QAM)	0.00	ITU	137.58	-73.05	12.75 (CORR)	17.05 dB	T/I	-4.31 (CORR)	
Profile C->B	(4QAM)->(256QAM)	0.00	ITU	137.58	-93.05	28.55	36.34 dB	T/I	-7.79	

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Site A
Schüttaustraße 52
48 13 38.32 N / 16 25 19.02 E
33: 5342542.7 605603.1

Site B
Vienna 02
48 12 37.50 N / 16 26 9.60 E
33: 5340684.5 606681.6
Discrimination Angle: 6.97°

Site C
Floridusg. 46
48 15 0.00 N / 16 24 43.00 E
33: 5345050.9 604813.6
Discrimination Angle: 0.62°

Site D
Wagramerstraße 21
48 14 5.24 N / 16 25 17.33 E
33: 5343373.4 605552.8

Design Channel A: C25/37401 B: C25/38661 Interfering Path 1 of 1 1147-1 Primary

NOTE: Negative Margin (dB) indicates possible interference.

6.2.2.4.2.2 Cumulative Details

To see additional details for a particular channel, highlight the channel and click on the **Cum Details...** button:

Cumulative Analysis Details
? ×

Site A: Schüttaustraße 52 (L)						Site B: Vienna 02 (H)								
Link Id	Interfering Link	Channel / Pol	Free Space Loss A (dB)	C/I Calc A (dB)	OH Loss A (dB)	Loss Type A	Int Level A (dBm)	XPIF A (dB)	Free Space Loss B (dB)	C/I Calc B (dB)	OH Loss B (dB)	Loss Type B	Int Level B (dBm)	XPIF B (dB)
1	1147	Floridusg. 46 (L) - Wagramerstraße 21 (H)	A99H - A99H	122.45	106.04	*	N/C	-170.54	137.58	28.55	0.00	ITU	-93.05	
2	5037	Eßlinger Hauptstr. 82 (H) - Umspannwerk Aspern (L)	A98H - A98H	141.83	59.48	*	N/C	-123.98	137.36	124.36	*	N/C	-188.86	
3	3153	19.,Pfarrplatz (H) - 19., Himmelstraße 23 (Kirche) (L)	A97H - A97H	139.19	116.59	*	N/C	-181.09	142.92	80.42	*	N/C	-144.92	
4	1005587	Schüttaustraße 52 (L) - Steinbrechergasse 22 (H)	C29V - C29V	128.18	83.35	0.00	ITU	-147.85	130.69	57.31	*	N/C	-170.81	
5	2300	Hauptstraße (H) - KW Greifenstein (L)	A99H - A99H	149.04	128.46	*	N/C	-192.96	150.77	84.59	*	N/C	-149.09	
6	4111	Karl Schäferstraße 3 (L) - 21., Brunner Straße 68-70 (H)	A97H - A97H	137.27	133.56	*	N/C	-198.06	140.81	85.33	*	N/C	-149.83	
7	2021	SCS Vösendorf (L) - SCS-Bueroenter/Parkdeck (H)	A97H - A97H	147.83	85.64	*	N/C	-150.14	147.14	142.47	*	N/C	-206.97	
8	2168	Eßlinggasse 16 (L) - Zentrum F.W. Raiffeisen Platz (H)	A98H - A98H	135.37	129.27	*	N/C	-193.77	137.85	85.73	*	N/C	-150.23	
9	3079	21.,Leiner Langenzersdorf (L) - 21.,Russbergstraße 13/13 (H)	A99H - A99H	141.60	131.91	*	N/C	-196.41	144.88	89.06	*	N/C	-153.56	
10	4009	Fischamend Reichsstraße (H) - Flughafen Wien, Softel (L)	A97H - A97H	148.92	90.10	*	N/C	-154.60	146.76	127.02	*	N/C	-191.52	
11	892	Dampfmühlgasse 3 (H) - Laaerberg (L)	A99H - A99H	138.26	90.32	*	N/C	-154.82						
12	5034	Döblinger Hauptstrasse 1 (L) - BSC TGM Wexstr. (H)	B49H - B49H	136.12	123.05	*	N/C	-187.55	140.48	90.69	*	N/C	-155.19	

Cumulative Summary

C/I Obj (A/B):	36.34 / 36.34 dB	C/I Calc (A/B):	59.43 / 28.55 dB	Int Level (A/B):	-123.93 / -93.05 dBm
FKTB (A/B):	-94.97 / -94.97 dBm	FKTB Margin A:	28.96 dB	FKTB Margin B:	-1.92 dB
Threshold(A/B):	-64.50 / -64.50 dBm	Degradation A:	0.01 dB	Degradation B:	4.07 dB

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The above window shows each link that contributes to the total interference into the design link.

7. Network Visualization

7.1. Network View



This is the graphical network display window. For a further detailed description, please refer to the [iQ-link Support & Microwave Design Forum](#).

Network View

File Edit View Search

AFP RSL C/I Chain

Latitude: 48 16 18.47 N Longitude: 16 23 32.13 E Elevation: 165.00 m

Legend

Frequency (GHz)	Capacity (Mb/s / Channels)	Terrain	Morphology	Site Symbol
7.00	4.00	0	Unclassified	Base Station
15.00	8.00	125	Open	BB Network
23.00	11.00	187	Bridge	BS
26.00	14.00	250	Water Features	BS with Fiber
28.00	16.00	312	Light Vegetation	Controller
38.00	21.00		Sparse Vegetation	Customer

Legend Polygon Point to Multipoint

Below is a brief description of each button:



Link Info

Click this button, then click on a link to see basic link details.



Copy Link

Click this button, then click on a link, then use File > Paste Link in the Main Engineering window, to work on an existing link.



Site Info / Create Site

Click this button, then click on a site to see basic details, or click on an empty area to create a new site.



Copy Site

Click this button, then click on a site, then use File > Paste as Site A/B in the Main Engineering window, to use a site in a link.



Detailed Profile

Click this button, then use your mouse to draw a line, and check the profile between the end-points.



Line-of-Sight Analysis

Click this button, then click on a point or a site to check LOS for the surrounding region (Radial mode) or sites (Selective mode).



Overlap Analysis

Used to check line-of-sight from two sites. Repeater sites can be placed to the locations where both sites have line-of-sight.



Clusters

Used to create/manage groups of links for display purposes



Chain Reliability

Used to check end-to-end reliability between a set of links.



Automatic Frequency Planning

Batch Interference Calculations (see more details in the User's Manual).



Zoom In

Increase magnification.



Zoom Out

Decrease magnification.



Re-Center

Reset main focal point.



Pan

Hold and drag to move freely.



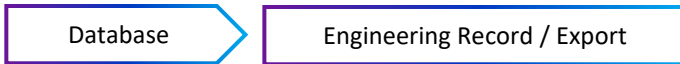
Refresh

Update page results.

8. Reporting and Exporting Data

8.1. Engineering Record / Export

You may export all or portions of your link data, including the reliability calculations to a text file or to a formatted HTML report using the Engineering Record report:



Engineering Record/Export

Query on: LIP Link

Site ID: Location ID:

Site Name:

Link ID: Band: GHz

Band	Link ID	Design ID	Status	Site ID	Site Name	Site ID	Site Name
743	28.00 5464	1	P	S3647/	1190 Pyrkergrasse 1	S3882/	BSC TGM Wexstr.
744	28.00 5465	1	P	S3653/	1180 Le		
745	28.00 5466	1	P	S3652/	1230 W		
746	23.00 5473	1	P	S3004/	Perlasg		
747	38.00 5474	1	P	S3762/	Zentag.		
748	38.00 5475	1	P	S3750/	Schlogl		
749	38.00 5483	1	P	S4053/	Te,p Sto		
750	38.00 5486	1	P	S3072/	Wiener		
751	38.00 DEMO1	1	W	VS3568/	Schütta		
752	26.00 S390025588	1	W	S3900/	Heiliger		

Current Template: engineering_record_R2.html

Default

Document View

comsearch iQ-link® – Microwave Engineering Record V9.7.0.22

Link ID: DEMO1 Status: W-Working Address: N/A

Link Name: _____

Frequency Band: 38.00 GHz Phone: N/A

Report: 1 of 1 Fax: N/A

Report Date: 19-Mar-2020 E-mail: N/A

Create Date: 06-May-2011 Created By: Henrik

Site ID / Location ID	VS3568 /	VS0002 /		
Site Name	Schüttaustraße 52	Vienna 02		
Street Name	Schüttaustraße 52			
City Name	1220 Wien			
Site Owner				
Coordinates (Lat,Lon)	48-13-38.3N, 16-25-19.0E	48-12-37.5N, 16-26-9.6E		
Coordinates (region:Northing,Easting)	33:5342542.7,605603.1	33:5340684.5,606681.6		
Ground Elevation (m)	163.000000	155.000000		
Radio Model	Model_38G14M_21-90M	Model_38G14M_21-90M		
Output Power (dBm) / Reference Modulation	15.00 / 256QAM ^{NCA}	15.00 / 256QAM ^{NCA}		
Spectrum Mask Class - Low Reference High	4 6 6	4 6 6		
Channel Spacing (MHz)	14.000000	14.000000		
Capacity (Mbit/s)	90	90		
Radio Manufacturer	MF4	MF4		
Frequency Plan: Frequency (MHz)	Low: 37443.000000	High: 38703.000000		
Polarization	V	V		
ATPC	TX Power (dBm)	RX Level (dBm)	TX Power (dBm)	RX Level (dBm)
Maximum	15.00	-39.11	15.00	-39.11
Maximum Trigger	4.44	-48.50	4.44	-48.50
Minimum Trigger	4.44	-48.50	4.44	-48.50
ATPC Modulation / Range (dB)	256QAM / 10.56		256QAM / 10.56	

V10.1.0.3

NOTE: Further report templates can be created by using a HTML editor.

8.2. Google Earth Export

You may export your entire network stored in iQ-link into a KMZ file which can be opened in Google Earth.

For more details on the Google Earth Export Utility, please visit the [iQ-link Support & Microwave Design Forum](#).

Utilities

Google Earth Export

Google Earth Export - V9.7.0.1

Login

Host/IP: 127.0.0.1
 Port: 1521 Use Oracle Client (OCI)
 SID: XE
 User Name: link
 Password: [masked]
 Disconnect

Link ID filter Location ID filter

Bounding Box

		Latitude	Longitude
Upper Right Corner	north	<input type="text"/>	east <input type="text"/>
Lower Left Corner	south	<input type="text"/>	west <input type="text"/>

Working Primary Confirmed Non Microwave
 All Sites Only Sites associated with links Site filter
 Auto Coordinate Transform

KMZ file: C:\Users\iqlink_network.kmz

idle
 Launch GE

9. Google Earth Connectivity

Google Earth Connectivity tool provides a detailed network overview using Google Earth application.



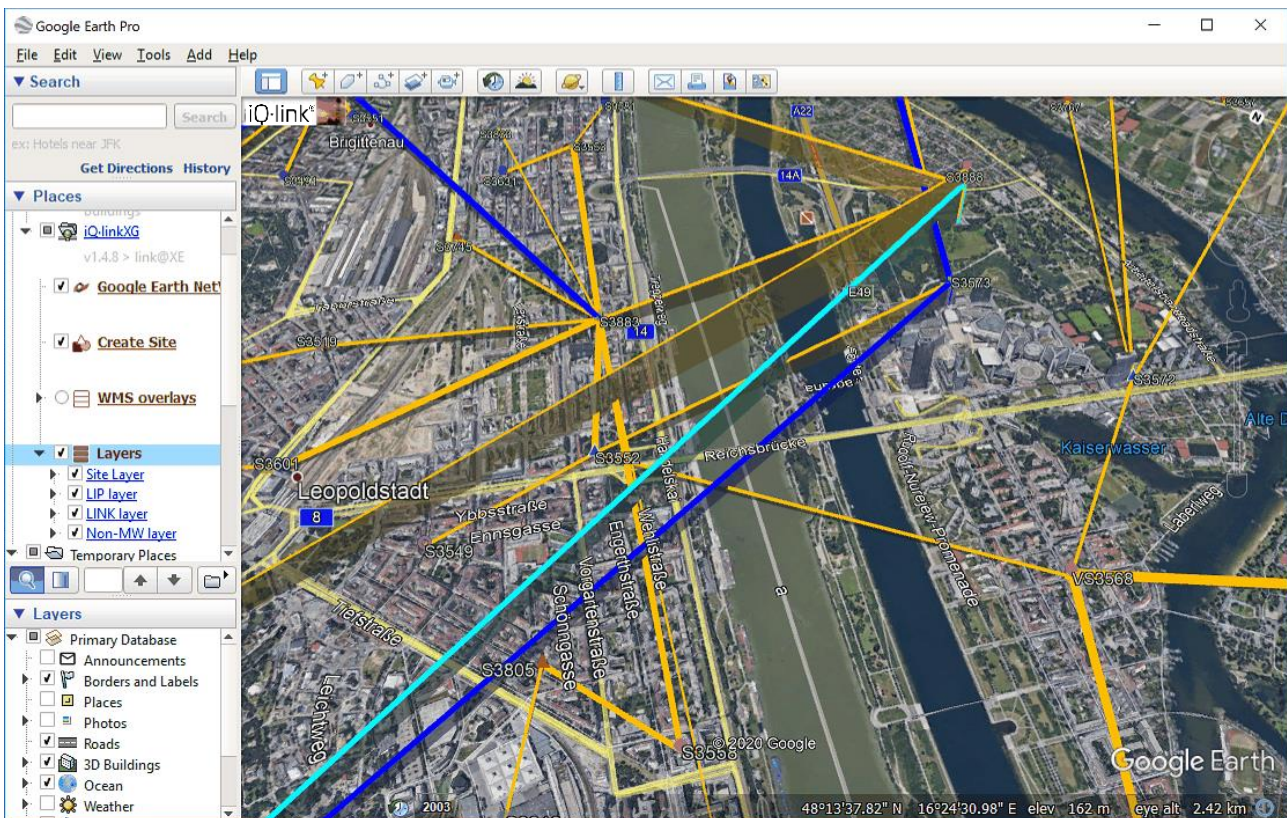
To use Google Earth Connectivity, you must have Google Earth installed.

iQ-link (see: earth.google.com) Google Earth Connectivity overlays Site, Microwave Link and Non-Microwave Link database of iQ-link, as well as makes toggle on/off Map Layer defined under iQ-link. Function can be found in Google Earth's Places window, under Temporary Places/ iQ-link folder.

For further detailed information on Google Earth Connectivity, please visit the [iQ-link Support & Microwave Design Forum](#).

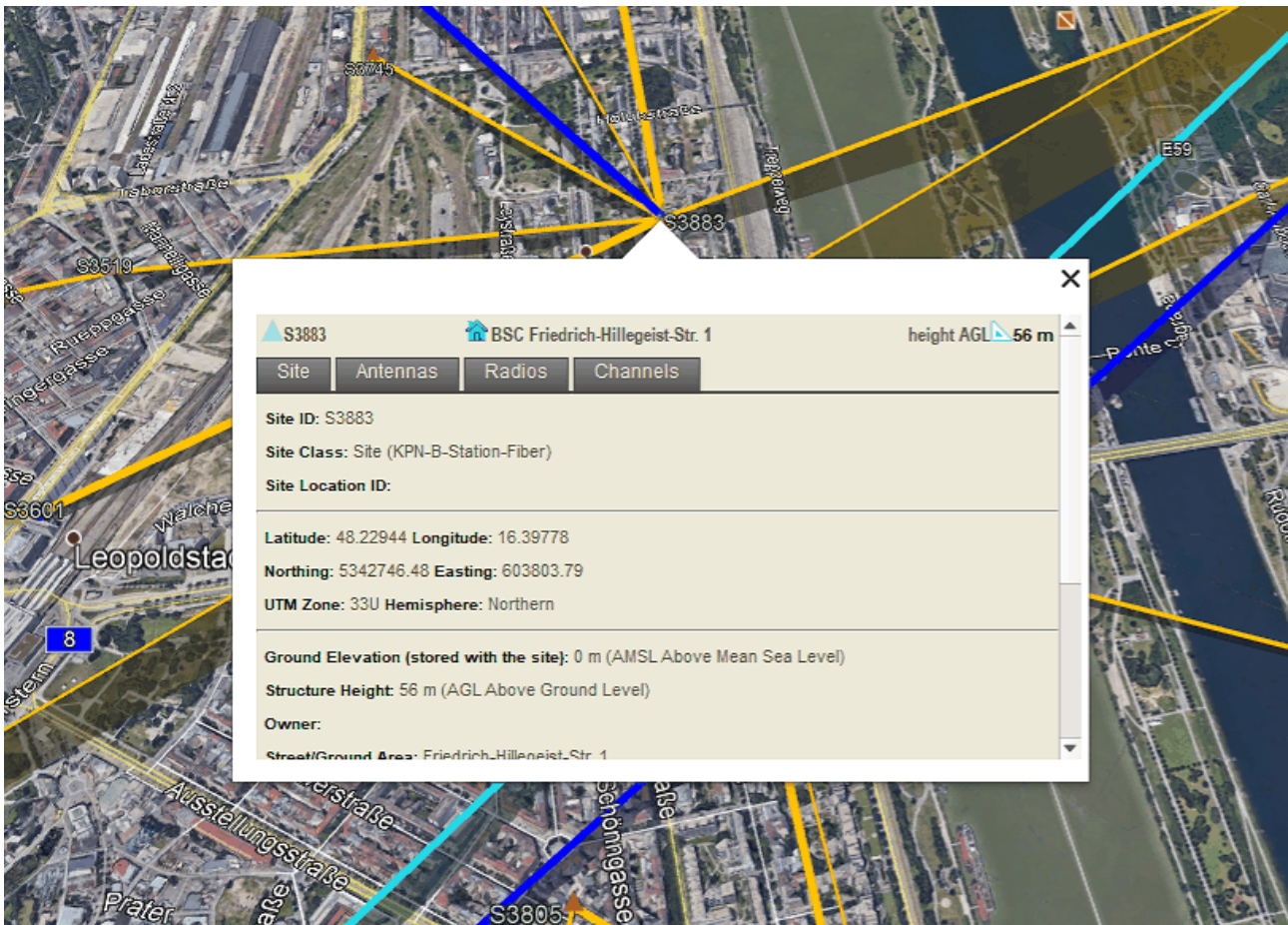
IMPORTANT: Google Earth Connectivity tool makes no data available on internet!

Site, Microwave, Non-Microwave Link data and Map data will be NOT shared on internet through Google Earth application; all overlaying data are stored on your local computer only.



9.1. Sites

By clicking on a site, the basic Info window appears with tabs of Site, Antennas, Radios and Channels tabs:

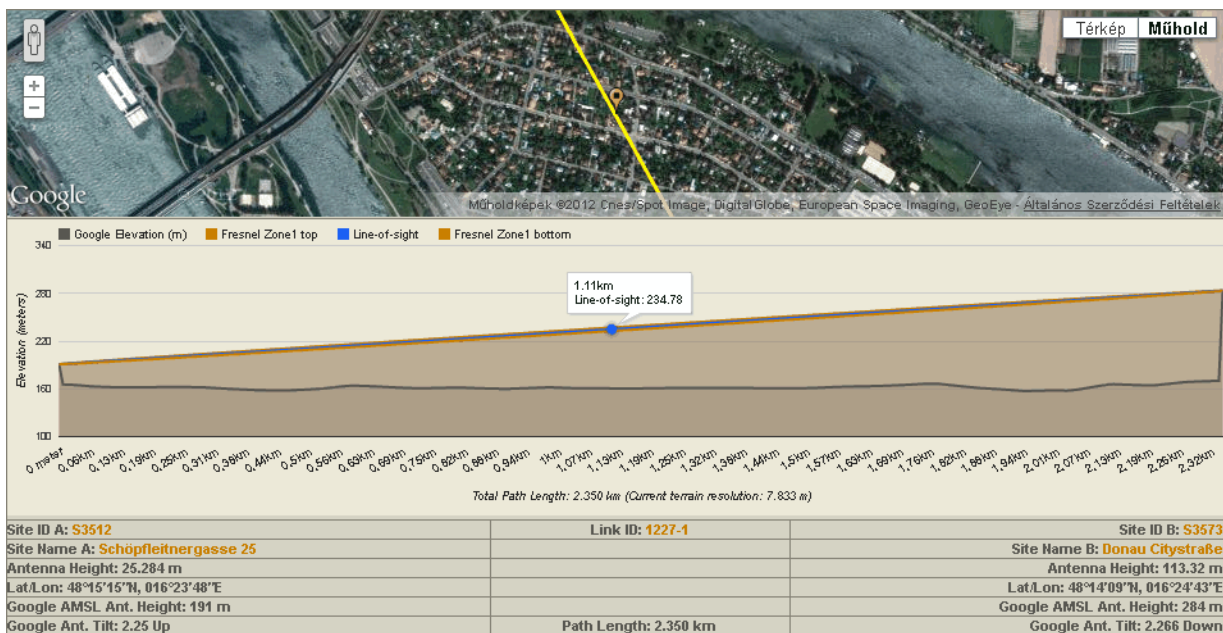


9.2. Microwave Links and Non-Microwave Links

By clicking on a Microwave (or Non-Microwave) Link basic Link Info window appears:

Link ID 810-1		Status	LIP (P)	Path Length	Band
Open in Browser		Path Profile		1.142 km	38 GHz
Sites / Sector ID		S3607		S3883	
Location ID:		Name:		Name:	
Praterstern 3-4		BSC Friedrich-Hillegeist-tr. 1		BSC Friedrich-Hillegeist-tr. 1	
Latitude/Longitude:		Latitude/Longitude:		Latitude/Longitude:	
48°13'13"N, 016°23'27"E		48°13'46"N, 016°23'52"E		48°13'46"N, 016°23'52"E	
Northing/ Easting:		Northing/ Easting:		Northing/ Easting:	
5341718.77 603306.35		5342746.96 603803.61		5342746.96 603803.61	
UTM Zone:		UTM Zone:		UTM Zone:	
33U		33U		33U	
Ground Elevation:		Ground Elevation:		Ground Elevation:	
159 m		157 m		157 m	
Antenna/Path Azimuth:		Antenna/Path Azimuth:		Antenna/Path Azimuth:	
26.85 Deg		206.85 Deg		206.85 Deg	
Mech./Elec./Path Tilt:		Mech./Elec./Path Tilt:		Mech./Elec./Path Tilt:	
1.05 Up		1.057 Down		1.057 Down	
Frequencies					
Plan:		High		Low	
Channel/Frequency Pol.:		B54 38692.500 H		B54 37432.500 H	
Radios					
Make:		MF1		MF1	
Model:		UX-38-7-16QAM-8x2		UX-38-7-16QAM-8x2	
Bit Rate:		8x2		8x2	
Bandwidth:		7.00 MHz		7.00 MHz	
Power:		16.00 dBm		16.00 dBm	
Branching Loss:		Tx: .00 dB Rx: .00 dB		Tx: .00 dB Rx: .00 dB	
Antennas (Primary)					
Make:		MF1		MF1	
Model:		SB1-380		SB1-380	
Gain:		39.60 dBi		39.60 dBi	
Height:		30		53	
Latitude/Longitude:		Latitude/Longitude:		Latitude/Longitude:	
48°13'13"N, 016°23'27"E		48°13'46"N, 016°23'52"E		48°13'46"N, 016°23'52"E	
EIRP:		33.60 dBm		33.60 dBm	
Other					
Field Margin:		1.00 dB		1.00 dB	
Absorption Loss:		0.13 dB		0.13 dB	
Free Space Loss:		125.2 dB		125.2 dB	
Total Propagation Loss:		125.33 dB		125.33 dB	
Receive Signal Level:		-52.13 dBm		-52.13 dBm	
Last Modified		Confirmed date:		User ID:	

Click on Path Profile button to see profile of selected link. Profile data are obtained online, 100% of 1st Fresnel-zone and Line-of-Sight between sites are displayed. Actual height data on profile and marker on overlay map will be show when cursor moves along profile.



9.3. Legends and Statistics

When Site, Microwave or Non-Microwave Link Layer subfolder are clicked in iQ-link folder a window appears with Site Symbol, Link Frequency Band, Link Capacity Legends and Statistics

Site Legend		Band Legend	Link/Capacity Legend	Site Legend	
Id	Icon	Site Symbol Name	Sites	SIPs	
1	□	node	1		
6	▲	KPN-MA_w_tower	3		
7	▲	KPN-B-Station-Fiber	4		
8	▲	KPN-B-Station	1		
14	■	Offshore_platform	1		
15	●	Customer	5		
16	⊙	Event-BCS	2		
17	⊙	Event-Mobile	4		

NOTE: This list of symbols is fully customizable, so the symbol and the name can be modified easily. Contact your Product Support Engineer for assistance, e-mail: customersupport@comsearch.com

Site Legend		Link Band Legend	Link/Capacity Legend	Link Band Legend		
Band	Confirmed LINK/Primary LIP LineStyle	Working LIP LineStyle	Confirmed	Primary	Working	
7 GHz	7 GHz	7 GHz	0	0	0	
15 GHz	15 GHz	15 GHz	0	0	0	
23 GHz	23 GHz	23 GHz	0	1	0	
26 GHz	26 GHz	26 GHz	0	0	0	
28 GHz	28 GHz	28 GHz	0	0	0	
38 GHz	38 GHz	38 GHz	0	8	1	
80 GHz	80 GHz	80 GHz	0	0	0	

NOTE: Adding a new Band to the Database is available via *Frequency Plan Module*. To add frequency plans to the database, click on the **Add button** of the *Frequency Plan Management System Window*.

Site Legend		Link Band Legend	Link/Capacity Legend	Link Capacity Legend		
Band	Capacity LineStyle in iQ.linkXG	Capacity LineStyle in Google Earth	Confirmed	Primary	Working	
4 Mbps	4 Mbps	4 Mbps	0	1	0	
8 Mbps	8 Mbps	8 Mbps	0	7	0	
16 Mbps	16 Mbps	16 Mbps	0	1	0	
21 Mbps	21 Mbps	21 Mbps	0	0	1	
42 Mbps	42 Mbps	42 Mbps	0	0	1	
52 Mbps	52 Mbps	52 Mbps	0	0	1	
66 Mbps	66 Mbps	66 Mbps	0	0	1	
78 Mbps	78 Mbps	78 Mbps	0	0	1	
90 Mbps	90 Mbps	90 Mbps	0	0	1	

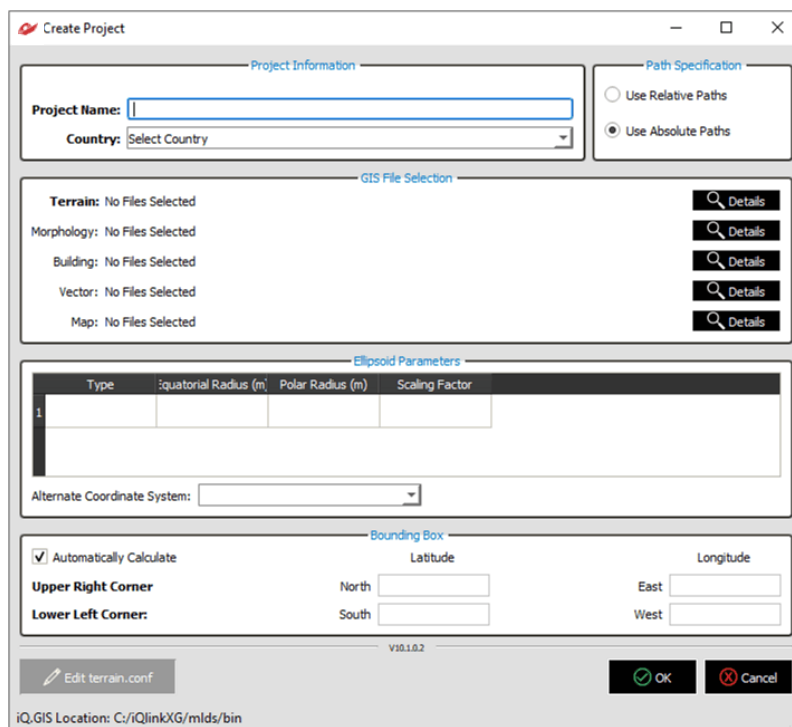
NOTE: The bitrate database is used to classify microwave link bitrates based on the capacity of the radio used and the number of channels assigned to each microwave link. The information stored through this interface is used by **Network View** to determine the total bitrate of each microwave link. To add a bitrate to the database, click the **Add Button** on the *Bit Rate Management System Window*.

10. Projects



Projects button can be found on the Login window. You may define projects located in different countries and set up GIS database as necessary for each project individually.

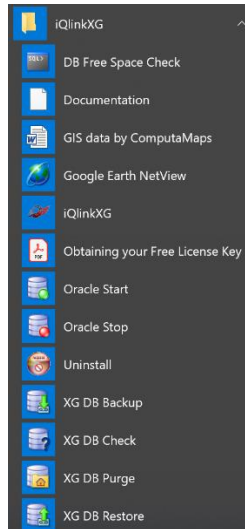
Click on Create, to set up a new project. Select Country from the drop-down list, and use the Details buttons to define location of Terrain, Morphology (clutter), Building, Vectors and 2D Map GIS data you would like to configure for your project:



Saved Projects can be activated by clicking *Make Current* button. For more details on the Project feature, please refer to the [iQ-link Support & Microwave Design Forum](#).

11. Database Maintenance Operations

A basic set of database utilities are available in Windows Start Menu / iQ-link / DB Admin subfolder for maintaining the Oracle database used by iQ-link. Further information is available on the [iQ-link Support & Microwave Design Forum](#).

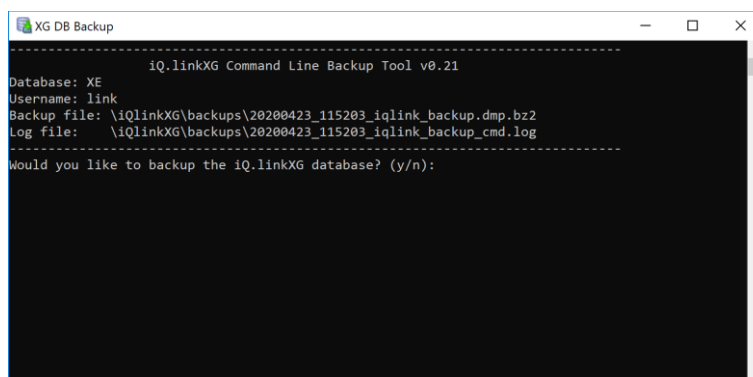


11.1. Database Backup

Database backup utility can be used for backing up your database, storing all equipment, site and link details in the backup file. GIS database will be NOT saved.



By starting *XG DB Backup* application a CMD window appears. Here hit “y” to start creating backup file. Backup file location is fixed, can not be changed.

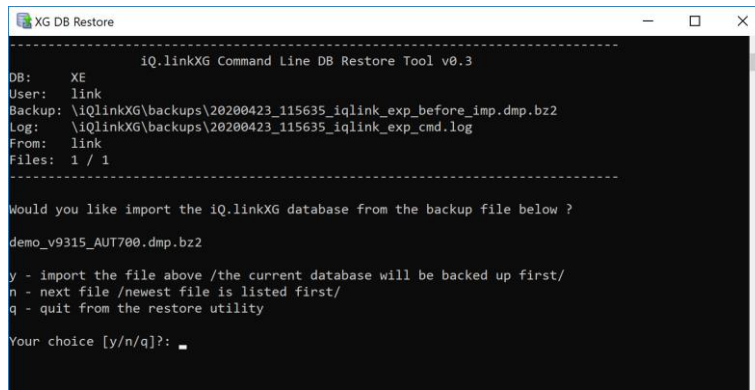


11.2. Database Restore

Database restore utility can be used to restore your database from previously backed up files. Restore utility loads into database saved dump file of all equipment, as well as site and link data.



By starting XG DB Restore application a CMD window appears, hit “n” for select next file and hit “y” to start process restoring from selected file. Restore file location is fixed, can not be changed.



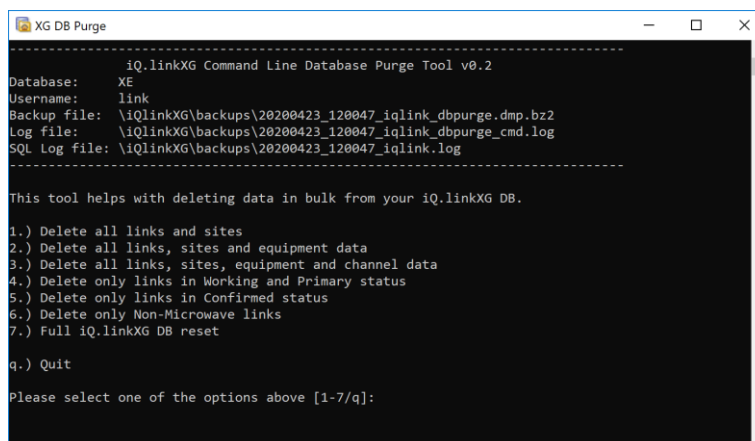
11.3. Database Purge

Database Purge utility can be used for cleaning your database from unnecessary data. Main purpose of this utility to remove the DEMO objects shipped with iQ-link installation package.

IMPORTANT: By using XG DB Purge utility all records of the selected object types will be deleted, selecting a subset of objects is NOT possible.



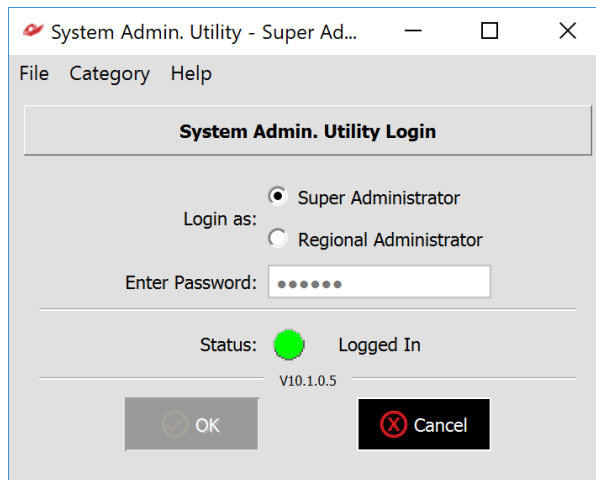
By starting XG DB Purge application a CMD window appears, hit “1” to remove all link and site data OR hit “2” to remove link, site, all equipment and frequency channel data.



12. iQ-link System Administration Utility



The System Administration Utility is to control iQ-link application settings and certain defaults. Rights of setting defaults are divided to Super Administrator and Regional Administrator parts. Both for Super Administrator and Regional Administrator default password is: **iqlink**



When a Database Purge is performed it is important to set up new equipment defaults after new antennas and radios were imported.

IMPORTANT: Parameter setting made in System Administration Utility can cause vital impact on link design. For details, please visit the [iQ-link Support & Microwave Design Forum](#).