

iQ·link®

The global toolkit for fixed wireless design





Featuring

- Collaborative, real-time, central database Enables numerous remote users to design concurrently. iQ·link serves customers with well over 100 concurrent users!
- Rapid analysis From bulk designs to mesh line-of-sight (LOS) and large-scale interference analysis.
- Frequency flexible Support for all microwave and fixed wireless access (FWA) frequency bands.
- Modern, intuitive user interface Logically presented information without the clutter of numerous pop-up windows.
- Near/non-LOS diffraction modeling Developed by Comsearch® principal propagation scientists.
- Efficient re-use of precious, limited spectrum Over 30 years of experience in spectrum management has been channeled into the interference analysis algorithms.
- Capability to handle any size network We have customers with databases of over 100,000 links!
- Complementary services

Including custom software development, enabling you to focus on your network planning.

Quick Link Budget Design

iQ·link enables rapid creation of point-to-point (PtP) or PMP links.

This engineering window provides a one-page summary of all of the necessary microwave link elements, enabling the user to build the link and make changes without the need to sort through a clutter of multiple windows.

🖉 Main Engineering		– 🗆 X
DEMO1-1 + LA	G Details	
🗅 File 🖕 (🖉 Profile 🚺 Design 💽 Interf	erence 🔍 Details 🖉 🔛 Recalc/Auto
Location ID:		
Site ID:	V\$3568	V50002
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	3: 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	n / 130.92 dB
Band:	38.00 GHz Frequence	cy Assignment: Paired Unpaired
🛞 Radio	Model_38G14M_21-90M	Model_38G14M_21-90M
Capacity/Modulation:	90.00 Mb/s / 256QAMACM 1+1_A_HSB	90.00 Mb/s / 256QAM ^{ACM} 1+1_A_HSB
Power:	15.00 6.60 dBm	15.00 6.60 dBm
Branching Loss:	Tx: 1.70 dB Bx: 1.70 dB	Tx: 1.70 dB Rx: 1.70 dB
Eroquonov Plant	High Low	Low High
Frequency Plan:	Tright Low	Low High
🕀 Channel	ID REF FREQ Pol T	ID REF FREQ Pol T
	C28 C28 37443 V P	C28 C28 38703 V P
Main Ant	VHI 01-38	VHI 01_38
Gaint	40 11 dBi	40 11 dBi
Height:	35.00 m AG	35.00 m AGI
Lat/on:	48-13-38.3 N/16-25-19.0 F	48-12-37.5 N/16-26- 9.6 E
EIRP:	53.41 45.01 dBm	53.41 45.01 dBm
Diversity Ant.:		
Gaint	dBi	dRi
Height:		35
rill Wayaquida	NTI	1171
Total Length	TAL.	na.
Total Loss	dB	dB
T Attenuater	NTI	NTI
Common TX KX LUSS:	as as as	ar ar ar
Other Losses:	0.00 dB	0.00 dB
Region:Austria	ID:DEMO1-1 Working	Created By:Henrik

Comprehensive Support for Adaptive Modulation

The result of numerous discussions and meetings with major operators and equipment manufacturers, iQ·link offers the most comprehensive functionality to support the design of microwave links and FWA sites with adaptive modulation radios.

	General Inf	ormation				Tech	nnical Information			
	O Analog	Digital	E	and: 38.00	C	GHz	Stability:	0.00	0500 %	
Id:	131	Status: A	ctive Channel Bandw	vidth:	14.000000	MHz	MTBF:	17200	0.00 Hrs.	
Model:	Model_38G14M_21-90M		Min. Freque	ency:	37051.00	MHz	Max. Frequency:	4009	98.00 MHz	
Manufacturer:	MF4					<u></u>				
Radio Type:	Hybrid		QPSK	16QAM	32QAM 6	4QAM	128QAM 256QAM			
Radio Code 1:		Type Approval: N	• <u> </u>	in the F						
Radio Code 2:		Cluster: Y	es _	proval #:	14.9			N. L.C.		
	ATF	C		Capacity:	21	Mbit/s		Mask Class:	2 -	
ACM Power Boost		Maximum Boos	it: dB	roughput:	21.00	Mbit/s	Emission	Designator:	14M0G7W	1
Apply same ATPC v	values for all modulation schemes	(for ACM radios)	Min. T	x. Power:	1.00	dBm	Max	(TX. Power:	23.00	dt
	RTF	c	RX Inr. (t	SER 10 -):	-86.50	dBm	RX Inr	(BER 10 %):	-84.50	
	No ATPC	ATPC	Distol Min Signa	turo PW	-20.00		Non Min. Si	icophiro RW	-/9.50	
Attenuator: Power Limiter:	~	V	Min. Signa	ature Ht	12.0000	dB	Non Min. S	Signature Ht.	26.00	de
Att. & PL.:			Name of gr	Ain Delay:	6.30	ns	No	on-Min Delay:	6.30	ns ns
RTPC Step Size:	1.00 dB		Dispe	ersive FM:	99.00	dB	0.00	XPIF:	15.00	dE
ACM Pwr. Adjust:	Engineering Reference	<u>-</u>	Netf	Filter D.F:	0.00	dB		FKTB:	-95.27	dE
Apply same RTPC v	values for all modulation schemes	(for ACM radios)					ACM	Drop Offset:	0.00	dE
X TYP RX GUA BER	Comm 10B	ents					ACM Re	eturn Offset:	0.00	dB
			ATPC	Capable:	Yes 💌	Note: Ent modulation	er default ATPC parameters to be of a link.	applied if config	ured as the highes	st
			ATPC	Margin 1:	0.00	dB	AT	PC Margin 2:	0.00	dE
			ATPC Rece	ive Level:	-69.50	dBm				
				RTPC:	Yes 👻					
			RTPC At	t. Range:	0.00	dB	RTPC Power Li	miter Range:	0.00	dB
						<u>.</u>				

Radio State Analysis Graphics

An innovative graphical user interface presents modern IP radio's options to the designer in the most intuitive way possible.



Availability and Performance Assessment

iQ·link performs link availability and performance calculations using industry standard propagation and objective models including Vigants, Glauner, ITU-R P.530 (revisions 6 through 17) ITU-T G.821 and G.826, Crane, ITU-R P.837-3, ITU-R P.837-1, ITU-R P.837-3, ITU-R P.837-5/6, ITU-R P.837-7.

-					- 0
		_			
k Id:DEMO1	Design Id: 1	Objectives: Ge	eneral 🚬	Prediction N	1ethod: P.530-15/16
Fade Margin Details					
		Site A		Site B	i
Site	e Id/Location Id:	VS3568 / Schüttaustraße 52		VS0002	
o	bstruction Loss:	Schuttaustrabe 52	0.00 dB At 50.0000%	Vienna u	2 Details
Primary / Divers	sity / ATPC RSL:	-39.10 / N/A / -48.50 dBm	1	-39.10 / N/A / -4	8.50 dBm
Threshold/ACM Drop Level:	10 ⁶ BER 10 ³ BER	-60.50 dBm		-60.50 dBr	n
Thr. Deg. A / Field Marg	in / Thr. Deg. B:	0.00 dB Manual	1.00 0	iB 0.00	dB Manual
Composi	ite Fade Margin:	20.40 dB		20.40 dB	Λ
	Rain		Diversity XP	▷	
Rain Rate Method: 💌	ITU-R P.837-7				
0.01% Rain Rate:	28.8 mm/hr Combin	ned Rain and Wet Snow (UK)	Frequency Div	/ersity	
	Combir	ned Rain and Wet Snow (P.530-16	5) Improvement Fa	ctors A -> B B -> A	к.
Polarity: Vertical			Frequency Diversity	NIL NIL	
				1146 1146	
Multipath Details			Target Objective	ACM Statistics	
Geoclimatic: 15260	.304 x 10 ⁻⁸ Calcul	ator	Chiective	99,9950 %	
Roughness: 1.00	Default Calc.	from Terrain	Rain FFM Reod	: 17.87 dB Pwr Read: 12.47	dBm
Climate: 1.00			Multipath CFM Rego	: 0.00 dB Pwr Read: -5.40	dBm
Avg Ann. Temp: 10.00	°C				
		Resu	lts		
wo Way	Unavailability:	VM Annual Outa	age: WM Annual		
	_			View	/ All Modulations
Unavailability:		Uptime(%) D	owntime(%)	Downtime(sec)	All Modulations Downtime(sec/km)
Unavailability:	Rain	Uptime(%) D 99.996820	owntime(%) 0.003180	Downtime(sec) 1002.86	All Modulations Downtime(sec/km) 466.64
Unavailability: Outage: Flat M	Rain ultipath	Uptime(%) D 99.996820 99.999995	owntime(%) 0.003180 0.000005	View Downtime(sec) 1002.86	VAII Modulations Downtime(sec/km) 466.64 0.66
Unavailability: Outage: Flat Mi Si	Rain ultipath elective	Uptime(%) D 99.996820 99.999995 100.000000	owntime(%) 0.003180 0.000005 0.000000	View Downtime(sec) 1002.86 1.43 0.00	VAII Modulations Downtime(sec/km) 466.64 0.66 0.00
Unavailability: Outage: Flat M Si Total	Rain ultipath elective Outage	Uptime(%) D 99.996820 99.9999995 100.000000 99.999995	owntime(%) 0.003180 0.000005 0.000000 0.0000005	View Downtime(sec) 1002.86 1.43 0.00 1.43 (201 20	Downtime(sec/km) 466.64 0.66 0.00 0.66
Unavailability: Outage: Flat M So Total Unavail. +	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.000000 99.999995 99.9996815	owntime(%) 0.003180 0.000005 0.0000005 0.000005 0.003185	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	All Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31
Unavailability: Outage: Flat M Si Total Unavail. +	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.00000 99.999995 99.996815	owntime(%) 0.003180 0.000005 0.000000 0.000005 0.000005 0.003185	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	VAII Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31
Unavailability: Outage: Flat M Si Total Unavail. +	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.000000 99.999995 99.999995 99.999995 99.9996815 99.996815	owntime(%) 0.003180 0.000005 0.000000 0.000005 0.000005 0.003185	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	2 All Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31
Unavailability: Outage: Flat M So Total Unavail. +	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.000000 99.999995 99.996815	owntime(%) 0.003180 0.000005 0.0000005 0.000005 0.000005	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	2 All Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31
Unavailability: Outage: Flat M Si Total Unavail. + Generic Voice Da	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.00000 99.999995 99.996815	owntime(%) 0.003180 0.000005 0.000000 0.000005 0.003185	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	VAII Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31
Unavailability: Outage: Flat M Si Total Unavail. + Generic Voice Da	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.000000 99.999995 99.996815	owntime(%) 0.003180 0.000005 0.000000 0.000005 0.003185	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	2 All Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31
Unavailability: Outage: Flat M Si Total Unavail. + Generic Voice Da	Rain ultipath elective Outage Outage	Uptime(%) D 99.996820 99.999995 100.000000 99.999995 99.9999815 99.996815	owntime(%) 0.003180 0.000005 0.000005 0.000005 0.003185	View Downtime(sec) 1002.86 1.43 0.00 1.43 1004.28	All Modulations Downtime(sec/km) 466.64 0.66 0.00 0.66 467.31

Detailed Path Profile Analysis

iQ·link's Profile Module generates a terrain profile between two sites to determine the LOS characteristics of the proposed link. The terrain profile can also incorporate clutter data such as buildings and vegetation.



Detailed Path Profile Analysis

The Path Profile can be exported in Google Earth's KMZ format, showing the 3D Fresnel Zone with layers corresponding to the Fresnel Zone percentage, allowing for an accurate visualization of the effect of an obstruction in the path.





Live Integration with Google Earth™

iQ·link offers a direct LIVE integration with Google Earth™. As links are planned and saved in iQ·link, they automatically appear in Google Earth! Anyone in your organization—from engineers to the market-ing department—can have a detailed view into the network.



Interference Analysis

iQ·link's detailed, efficient interference analysis calculates the interference potential from a proposed new link against the database of all previously stored primary designs and confirmed links. Both PtP and PMP systems are considered simultaneously.

Other options include the ability to utilize 3D antenna patterns when available, predict diffraction loss along interference paths due to obstacles and relax interference objectives due to correlated fading in bands where rain is the primary fading mechanism.

Also offered is automatic frequency planning (AFP), enabling rapid auto-assignment of interference-free channels to numerous links in bulk. This feature also incorporates a sophisticated high/low conflict resolving algorithm.

✓ IA Culling Parameters	- 🗆 X
General Filters	Adaptive Modulation
Search Radius: 40.00 km Count: 8 of 8 Links Filter	Modulation Scheme: Highest Lowest Eng. Ref. Lowest -> Highest Worst Case
Link Filter Options: Analyze all links	PMP
Design Path Polarity: H Both	Exclude Design Carriers: Down Link Up Link Up Link in Sector
Assign Existing Polarity First?: Yes No	Additional Analysis Ontions
Allow Polarity Change?: Yes No	Cumulative Analysis: Yes No
Channel Selection	Cumulative OH Threshold: 0.00 dB
Analyze Channels: Assigned Channels Only Partial Band Full Band	
Assign Existing Channels First?: Yes No	Antenna Discrimination Mode: 2D 3D
Partial Band Filter (Site A / Site B): Min: C25 / C25 Max: C28 / C28 Channel Pool	Use Correlated Criteria: Yes No Angle/LR/M: 5.00°/1.00/5.00 dB
Frequency Window: 112 MHz(+/-)	Use XPIF: Yes No
If more than 1 channel is available, then Most Least Degradation, or First Channel in List	Exclude Design Path X-Pol Cases: Yes No
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	
C/I Method Parameters	
Margin: 0.00 dB Default C/I Obj.: 37.00 dB	
Cumulative Degradation Limit: dB	
OH Loss	
Calculate OH Loss: Yes No B - Maritime Temperate Over Land	
Include Building Include Morphology	
Profile Start Distance: 0.00 km Profile K Factor: 1.33 💌	
ATPC	
Use ATPC Criteria: Yes No	
Design Path Power: TXmax TX ATPC	
Environment Path Power: TXmax TX ATPC	
V10501	
Calculate	(8) Out
Calculater	e eur

Interference Analysis

✓ Interference Case Details	– 🗆 ×
Environment Path Details	
Site ID / Location ID: \$33532/ \$3609/ Site Name: Troststr. 125 10, Knöllgasse 19-21/Stg. 1 Latitude Longitude: 48-10-22.0N 16-21-21.0E UTM Zone: North East: 33: 5336609.0 600796.1 Gnd Elev & Length: 229.00 m 0.30 km 221.00 m Path Azimuth: 43.70° 223.70° 223.70° Radio Model: UX - 38 - 3.5 - 4QAM - 2x2 UX - 38 - 3.5 - 4QAM - 2x2	Site A Schüttaustraße 52 48 13 38.32 N / 16 25 19.02 E 33: 5342542.7 605603.1 Discrimination Angle: 69.28° Site B Vienna 02
Capacity / BW / Mod.: 2x2 Mb/sec / 3.5 MHz / 4QAM 2x2 Mb/sec / 3.5 MHz / 4QAM	33: 5340684.5 606681.6
Power: 15.00 dbm Channel / Freqency: A99 Antenna Model / Hgt: SB1-380 (Gain: 0.00 dBi) / 24.00 mAGL Antenna Coordinate: 48-10-22.0N 16-21-11.0E 33: 5336389.2 600593.4 Waveguide Loss: 0.00 dB Pree Space / Abs. Loss: 113.56 dB / RSL / Threshold: -128.59 dBm / -82.00 dBm	
Calculation Results - Include OH Loss: Yes No Exclude Environment Link In Future Analyses Prev. More	
Interference Radio OH Loss Loss FSPL Int Level C/I Calc Int Obj Int Mode Margin S Calculation Modulation (dB) Type (dB) (dBm) (dB) Int Mode (dB)	-to-
Profile A->D (256QAM)->(4QAM) 167.42 ITU 142.04 -292.40 -8.61 (CORR) 17.05 dB T/I 141.76 (CORR)	Site C
B->C	10., Knöllgasse 19-21/Stg. 1 48 10 29.00 N / 16 21 21.00 E 33: 5336609.0 600796.1
Next Path Prev. Path Next Channel Prev. Channel Update Design VQuit Print V	Site D Troststr. 125 48 10 22.00 N / 16 21 11.00 E 33: 5336389.2 600593.4 Discrimination Angle: 356.46°

Bulk Link Design

iQ·link provides the user with the tools to perform Bulk Link designs, Obstruction Loss calculations, Interference Analysis, and Automatic Frequency Planning (AFP) by modifying the Link configuration in an Excel or delimited text template and then importing them into iQ·link. This streamlined design workflow can translate into great savings in both time and resources.

e Name:	C:/Users/Henrik/Desktop/tmp/file	.xlsx				Select:	Î	Delete	•
ordinate	e System: Geographic (Lat/Lon)	-	L	Inits: 🗸 Met	tric 🗌 Englis	h	Header	Included	:
		Calc	ulate Obstruct	tion Loss					
limate: /	A - Continental Temperate			v	K Factor	: 1.33	- V	Run AFP	
	Include User Cl	utter 1	Include Building	Include Mo	rphology			Run Des	ia
			and due banany	1100000110	(prioreg)				
resnel Zo	one: 1.0			Minimum	Clearance (m)	: 5.0		Run IRF	
e import fil oping requ Capacit	ile can not be validated until minim uires right dicking on column head ty A Radio Model A	um colun er, and i	nn mapping is o dentifying the A Low Mod. A	completed. Min column from a A Ref. Mod. A	imum is Site A a pick list. A High Mod.	and Site B Coordina A Radio Conf. A	ates. IDU Conf.	A Superv	ris
e import fil oping requ Capacit 66	ile can not be validated until minim uires right dicking on column head ty A Radio Model A Model_38G14M_21-90M	um colun er, and i ADM_4 Y	nn mapping is o dentifying the A Low Mod. / QPSK	completed. Min column from a A Ref. Mod. A 64QAM	imum is Site A pick list. A High Mod. 64QAM	and Site B Coordina A Radio Conf. A 1+1_A_HSB	ates. IDU Conf. /	A Superv	ris
e import fil oping requ Capacit 66 999	ile can not be validated until minim uires right dicking on column head ty A Radio Model A Model_38G14M_21-90M FlexPort80	um colun er, and i ADM_A Y Y	nn mapping is o dentifying the A Low Mod. A QPSK BPSK-250	completed. Min column from a A Ref. Mod. A 64QAM QPSK-1G	imum is Site A a pick list. A High Mod. 64QAM QPSK-1G	A Radio Conf. A 1+1_A_HSB 1+0	ates. IDU Conf. /	A Superv	ris
capacit Capacit 66 999 4x2	ile can not be validated until minimu uires right dicking on column head ty A Radio Model A Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2	um colum er, and i ADM_A Y Y N	A Low Mod. A QPSK BPSK-250 N/A	completed. Min column from a A Ref. Mod. A 64QAM QPSK-1G N/A	imum is Site A a pick list. A High Mod. 64QAM QPSK-1G N/A	A Radio Conf. A 1+1_A_HSB 1+0	ates. IDU Conf. :	A Superv X	ris
Capacit 66 999 4x2 4x2	ile can not be validated until minimu uires right dicking on column head ty A Radio Model A Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2	ADM_A Y N N	A Low Mod. A QPSK BPSK-250 N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A	A High Mod. 64QAM QPSK-1G N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0	ates. IDU Conf.	A Superv	ris
Capacit 66 999 4x2 4x2 4x2	ile can not be validated until minimu uires right clicking on column head ty A Radio Model A Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2	um colum er, and ii ADM_/ Y Y N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A	High Mod. 64QAM QPSK-1G N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0	ates. IDU Conf	A Superv	ris
Capaciti 66 999 4x2 4x2 4x2 8x2	ile can not be validated until minimu uires right dicking on column head Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2	ADM_A Y N N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A N/A N/A	High Mod. 64QAM QPSK-1G N/A N/A N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0 1+0 1+1HSB	ates. IDU Conf. :	A Superv X	ris
E import fil pping requ 66 999 4x2 4x2 4x2 4x2 8x2 2x2	ile can not be validated until minimu uires right dicking on column head Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 23 - 14 - 4QAM - 8x2 UX - 38 - 3.5 - 4QAM - 2x2	ADM_4 Y Y N N N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A	High Mod. 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0 1+0 1+1HSB 1+0	ates.	A Superv	ris
Capacit 66 999 4x2 4x2 4x2 8x2 2x2 4x2	ile can not be validated until minimu uires right clicking on column head Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 3.5 - 4QAM - 2x2 UX - 38 - 7 - 4QAM - 4x2	ADM_A Y Y N N N N N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A N/A N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A N/A	High Mod. 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0 1+1HSB 1+0 1+1HSB 1+0 1+0 1+0	ates. IDU Conf.	A Superv	ris
Capacit 66 999 4x2 4x2 4x2 4x2 2x2 4x2 2x2 4x2 4x2	ile can not be validated until minimu uires right dicking on column head Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 23 - 14 - 4QAM - 8x2 UX - 38 - 3.5 - 4QAM - 2x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2	ADM_A Y Y N N N N N N N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	High Mod. pick list. A High Mod. 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0 1+0 1+1HSB 1+0 1+1HSB 1+0 1+0	ates. IDU Conf.	A Superv X 	ris
Capacit 66 999 4x2 4x2 4x2 4x2 2x2 4x2 4x2 4x2 4x2 4x2	ile can not be validated until minimu uires right dicking on column head Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 3.5 - 4QAM - 2x2 UX - 38 - 7 - 4QAM - 2x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2	ADM_4 Y Y N N N N N N N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A N/A	High Mod. pick list. 4 High Mod. 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0 1+1HSB 1+0 1+1HSB 1+0 1+0	ates.	A Superv	/is
Capacit pping requ 66 999 4x2 4x2 4x2 4x2 2x2 4x2 4x2 4x2	ile can not be validated until minimu uires right clicking on column head Model_38G14M_21-90M FlexPort80 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 3.5 - 4QAM - 8x2 UX - 38 - 7 - 4QAM - 2x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2 UX - 38 - 7 - 4QAM - 4x2	ADM_A Y Y N N N N N N N N N N N	A Low Mod. A QPSK BPSK-250 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	A Ref. Mod. A 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	imum is Site A a pick list. A High Mod. 64QAM QPSK-1G N/A N/A N/A N/A N/A N/A N/A N/A	A Radio Conf. A 1+1_A_HSB 1+0 1+0 1+0 1+1HSB 1+0 1+1HSB 1+0 1+0 1+0	ates.	A Superv	/is

Comprehensive Network View with Rapid LOS Calculations

Users have the ability to visualize environmental factors such as terrain, morphology, and clutter layers, as well as buildings, maps, aerial imagery, vector data and other layers.

Several engineering functions can be accomplished directly from this utility. This includes quick and detailed link profiles, rapid LOS analysis and reporting, site creation, chain reliability calculations and coverage, and carrier-to-interference (C/I) analysis for point-to-multipoint (PMP) /FWA systems.



Transmit (Tx) Spectrum and Receive (Rx) Selectivity

Detailed interference objectives between any combination of interfering and victim radios are quickly derived using Tx spectrum masks and Rx selectivity curves provided by the manufacturer or European Telecommunications Standards Institute (ETSI) defaults.

The interference objective curves can be calculated on-the-fly, this results in a very fast interference analysis with no impact on performance or on the quality of the results.

Since the interference objectives matrix no longer needs to be precalculated and saved to the database, installation times for new radio models is greatly reduced. This is especially important in networks with a large number of radio models.



Near and Non-line-of-sight (nLOS) Propagation model

Backhaul in a dense urban environment with small cells presents challenges traditional LOS microwave cannot always address. Radio frequency (RF) studies have shown that nLOS microwave can be a viable solution.

Comparison of these two plots (below) shows that there are many areas where the calculated received signal level (RSL) is improved using the nLOS algorithms. The highlighted area demonstrates such an example. In this partic- ular area, losses calculated using CommScope's nLOS algorithm are as much as 70 dB less than those calculated using the traditional ITU (International Telegraph Union) algorithm.



3.5 GHz RSL Plot using traditional ITU loss model



3.5 GHz RSL Plot using Comsearch nLOS model

PMP / FWA Design Functionality

iQ·link supports the design of hub-subscriber links that are required to implement such networks as FWA, local multipoint distribution service (LMDS), and other PMP applications.



Utility Programs

iQ·link comes with several utility programs so administrative tasks can be performed easily and with controlled access.

Utility features include:

- Easy import capability for sites, antennas, radios, links, network and Pathloss files
- Coordinate conversion
- Find-point algorithm
- System administration
- Google Earth KML export

Reports

iQ·link offers several reports, which are built on HTML templates and Database Views. They can be fully customized, including the addition of your own company logo.

These reports can be saved in PDF, EXCEL or CSV formats.

Document View		?
24	omsearch. iQ·link – Main Engi	neering Report
	Site A	Site B
Sites		
Location ID: Site/Sector ID: Name: Gov1Approval #: Latitude: UTM Zone: Northing Easting: Ground Elevation: Structure Height Antenna/Path Azimuth: Mech/Elec/Path Tilt Path Length:	V33568 Schüttaustraße 52 48-13-38.3 N 16-25-19.0 E 33: 5342542.7 / 605603.1 183.00 m 35.00 m 150.93 Deg 0.22 Down 2.15 km	VS0002 Vienna 02 48-12-37.5 N 16-26-9.6 E 33: 5340684.5 / 606681.6 155.00 m 35.00 m 330.94 Deg 0.21 Up
Frequencies Band: Plan: Chappel/Frequency Pol	38.00 GHz Low C28 37443.000 V	High C28 28703 000 V
Radios	020 37443.000 7	020 30703.000 4
Make: Model: Bit Rate: Bandwidth: Emission: Power: Branching Loss: Antennas	MF4 Model_38G14M_21-90M 90.00 Mb/s / 2560AM ^{4CM} (1+1_A_HSB) 14 MHz 14M0D7W 15.00 (6.60) dBm Tx: 1.70 dB Rx: 1.70 dB	MF4 Model_38G14M_21-90M 90.00 Mb/s / 2560AM ^{4CM} (1+1_A_HSB) 14 MHz 14M0D7W 15.00 (6.60) dBm Tx: 1.70 dB Rx: 1.70 dB
Drimanu		
Make: Model: Gain: Height: Latitude/Longitude: EIRP:	Andrew VHLP1-38 40.11 dBi 35.00 m AGL 48-13-38.3 N/16-25-19.0 E 53.41 (45.01) dBm	Andrew VHLP1-38 40.11 dBi 35.00 m AGL 48-12-37.5 N/16-26-9.6 E 53.41 (45.01) dBm

Third Party Application Integration

iQ·link offers the option to integrate with third party applications for both unidirectional and bidirectional workflows.

This allows iQ·link to update external applications and vice versa.







comsearch.com

Telephone: +1 703 726 5500 | Toll-free: 1 800 318 1234 | Email: customersupport@comsearch.com

© 2021 Comsearch, A CommScope Company. All rights reserved.

Unless otherwise noted, all trademarks identified by [®] or [™] are registered trademarks, respectively, of CommScope, Inc. This document is for planning purposes only and is not intended to modify or supplement any specifications or warranties relating to CommScope products or services. CommScope is committed to the highest standards of business integrity and environmental sustainability with a number of CommScope's facilities across the globe certified in accordance with international standards, including ISO 9001, TL 9000, and ISO 14001. Further information regarding CommScope's commitment can be found at www.commscope.com/corporate-responsibility-and-sustainability.