

Zon. 4



Cambium Networks™

Project Radom LINKPlanner Proposal Report

17 September 2015

Przemyslaw Pierzchala

Organization: MWM

Phone: 4832

Email: biuro@mwm.hostingpro.pl



Cambium Networks™

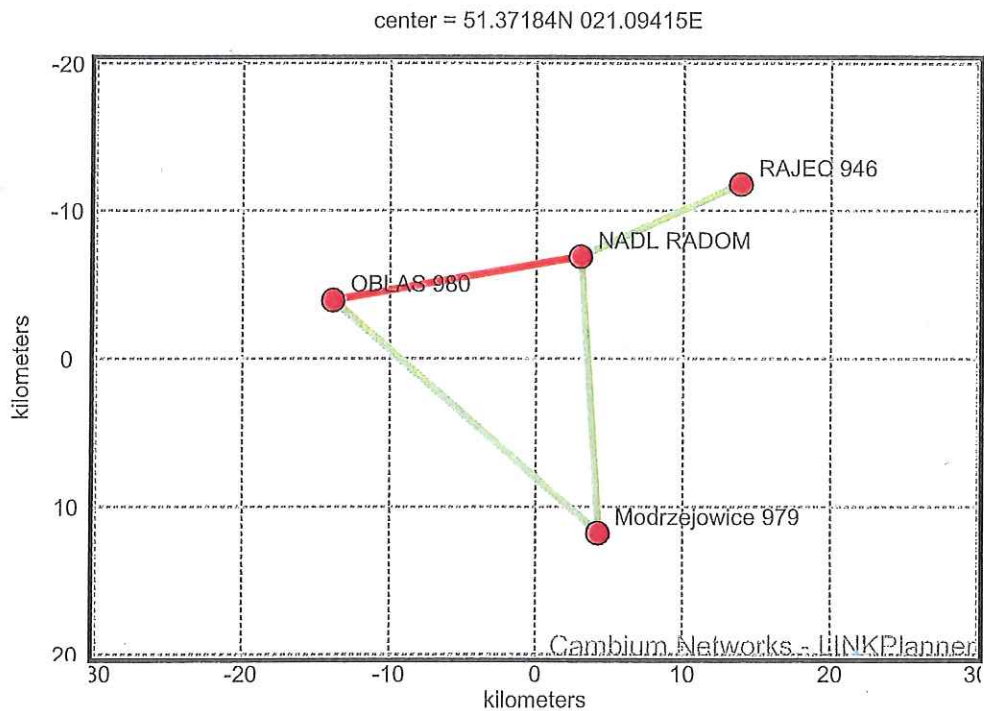


Table of Contents

1. Project Summary	3
2. Modrzejowice 979 to NADL RADOM	6
3. NADL RADOM to RAJEC 946	8
4. OBLAS 980 to Modrzejowice 979	10
5. OBLAS 980 to NADL RADOM	12
Disclaimer	15

1. Project Summary

Project: Radom

General Information

Customer Name NADLEŚNICTWO RADOM

Company Name

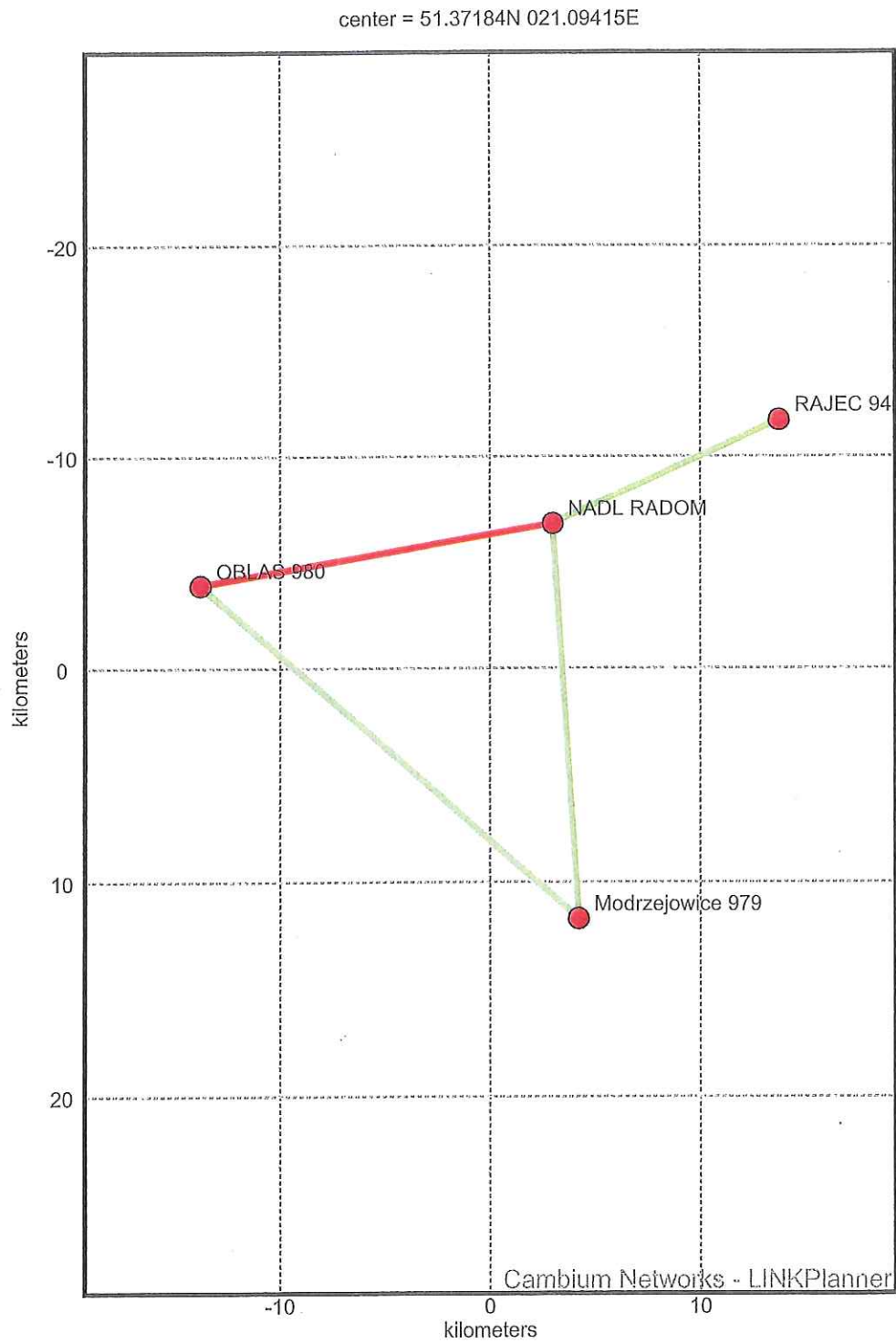
Address

Phone

Cell Phone

Email

Network Map

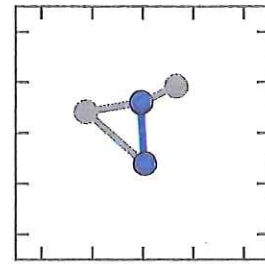


Link name	Product	Local antenna	Remote antenna	Max aggregate IP throughput (Mbps)
OBLAS 980 to NADL RADOM	PTP32800 with ODU-A	Cambium Networks 2ft HP Antenna 85010089037 - Direct	Cambium Networks 1ft HP Antenna 85010089036 - Direct	606.81
NADL RADOM to RAJEC 946	PTP650	Cambium Networks Integrated Dual Polar Antenna	Cambium Networks Integrated Dual Polar Antenna	403.94
Modrzejowice 979 to NADL RADOM	PTP650	Cambium Networks Integrated Dual Polar Antenna	Cambium Networks Integrated Dual Polar Antenna	354.68
OBLAS 980 to Modrzejowice 979	PTP650	Cambium Networks Integrated Dual Polar Antenna	Cambium Networks Integrated Dual Polar Antenna	306.76

Part Number	Qty	Description
(no part number)	2	Unspecified 32 GHz ODU (invalid TX frequency selection). Please select a TX frequency
(no part number)	2	Unspecified Mains Lead (set the region in the Bill of Materials options)
01010419001	21	Coaxial Cable Grounding Kits for 1/4" and 3/8" Cable
07009304001	2	Hoisting Grip for CNT-400 cable
30010194001	2	50 Ohm Braided Coaxial Cable - 75 meter
85010089036	1	1' HP Antenna, 31.80 ~ 33.40 GHz, Single Pol, Mot Interface
85010089037	1	2' HP Antenna, 31.80 ~ 33.40 GHz, Single Pol, Mot Interface
C000065K022	6	PTP 650 Lite (Up to 125Mbps) to Full (Up to 450Mbps) Link Capacity upgrade license per ODU
C000065L007	6	PTP 650 LPU and Grounding Kit (1 kit per ODU)
C050065H033	6	PTP 650 Integrated END with AC+DC Enhanced Supply (RoW - U.S. Line Cord). Kit includes ODU, power supply, mounting bracket and US line cord
WB3176	3	328 ft (100 m) Reel Outdoor Copper Clad CAT5E (Recommended for PTP)
WB3480	2	PTP800 Modem 1000/100BaseT with Capacity CAP 10 Mbps
WB3546	2	PTP800/PTP810 Modem Capacity CAP - 400 Mbps (per Unit)
WB3616	2	Coaxial Cable Installation Assembly Kit (W/O LPU End Kit)
WB3622	2	AC-DC Power Supply Converter (no lead cable included). Converts 110/230V to 48V.
WB3657	2	LPU END KIT PTP800 (1 kit required per Coaxial cable)



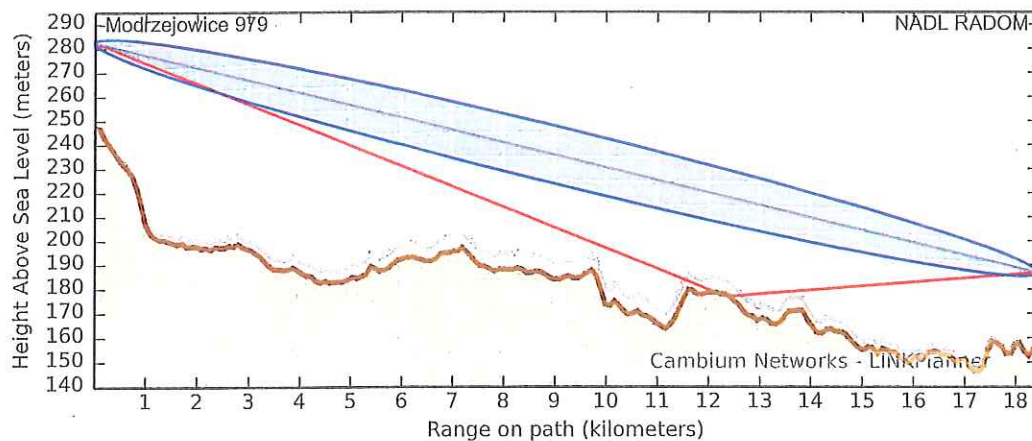
Modrzejowice 979 to NADL RADOM



Equipment: Cambium Networks PTP650 Full Integrated

Cambium Networks Integrated Dual Polar Antenna
@ 35 m

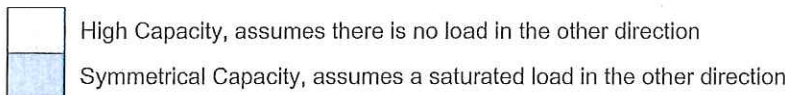
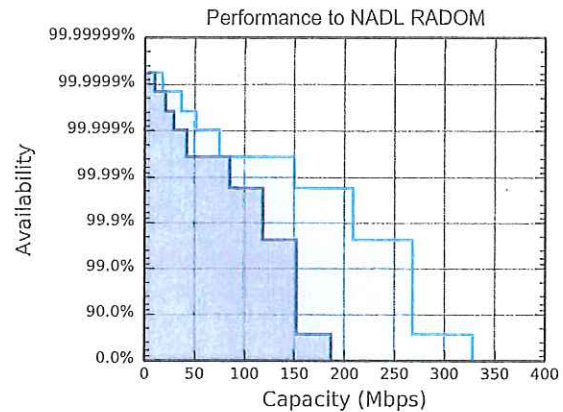
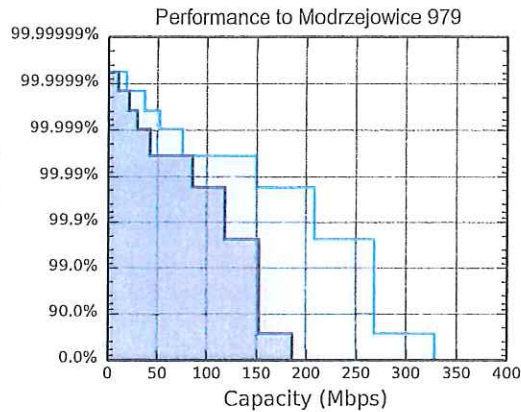
Cambium Networks Integrated Dual Polar Antenna
@ 30 m



	Performance to Modrzejowice 979	Performance to NADL RADOM
Mean IP	177.3 Mbps	177.3 Mbps
IP Availability	99.9999 % for 1.0 Mbps	99.9999 % for 1.0 Mbps

Link Summary			
Link Length	18.436 km	System Gain	161.28 dB
Band	5.8 GHz	System Gain Margin	28.09 dB
Regulation	Argentina (Private)	Mean Aggregate Data Rate	354.7 Mbps
Modulation	Adaptive	Annual Link Availability	99.9999 %
Bandwidth	45 MHz	Annual Link Unavailability	18 secs/year
Total Path Loss	133.19 dB	Prediction Model	ITU-R

Performance Charts



Climatic Factors, Losses and Standards

dN/dH not exceeded for 1% of time	-268.06 N units/km	Link Type	Line-of-Sight
Area roughness 110x110km	60.09 metre	Excess Path Loss	0.00 dB
Geoclimatic factor	1.44e-04	Atmospheric Gasses	ITU-R P.676-7, ITU-R P.835-4
Fade Occurrence Factor (P0)	2.92e-03	Diffraction Loss	ITU-R P.526-10
Path inclination	5.19 mr	Propagation	ITU-R P.530-12
0.01% Rain rate	33.81 mm/hr	Rain Rate	ITU-R P.837-5
Free Space Path Loss	133.01 dB	Refractivity Index	ITU-R P.453-9
Gaseous Absorption Loss	0.17 dB		

Part Number	Qty	Description
01010419001	6	Coaxial Cable Grounding Kits for 1/4" and 3/8" Cable
C000065K022	2	PTP 650 Lite (Up to 125Mbps) to Full (Up to 450Mbps) Link Capacity upgrade license per ODU
C000065L007	2	PTP 650 LPU and Grounding Kit (1 kit per ODU)
C050065H033	2	PTP 650 Integrated END with AC+DC Enhanced Supply (RoW - U.S. Line Cord). Kit includes ODU, power supply, mounting bracket and US line cord
WB3176	1	328 ft (100 m) Reel Outdoor Copper Clad CAT5E (Recommended for PTP)