Project Untitled 1, Link Ponto-A to Ponto-B

PTP LINKPlanner Installation Report

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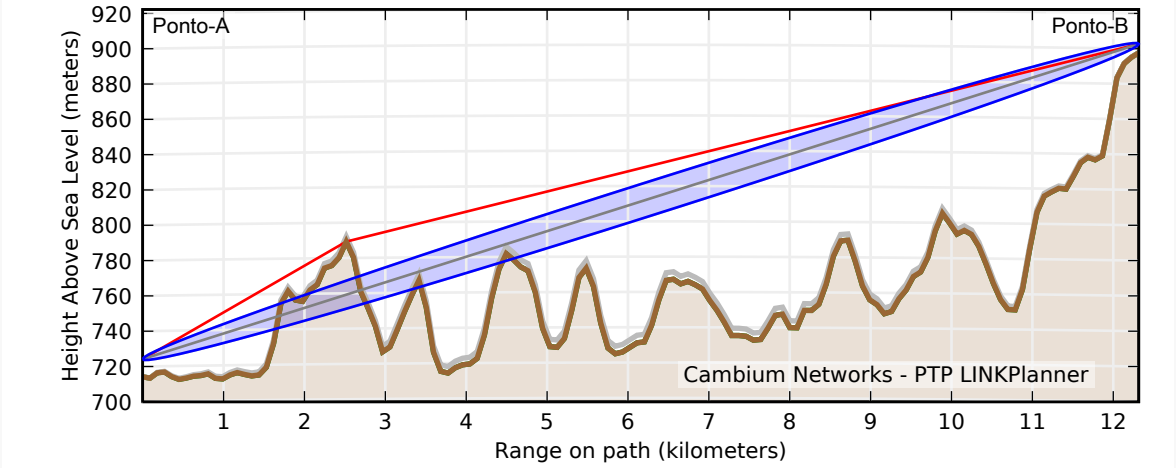
Summary	
Link Name	Ponto-A to Ponto-B
Link Type	Non Line-of-Sight
Equipment Type	PTP58600
Maximum Obstruction	0 meters
Link Distance	12.315 kilometers
Free Space Path Loss	129.51 dB
Excess Path Loss	32.52 dB
User IP Throughput Expectation Aggregate	Aggregate 102.96 Mbps assuming PTP-600 Series running the 600-10-04 software
RF Frequency Band	5.8 GHz (5725 to 5850 MHz)
RF Channel Bandwidth	30 MHz

Path Profile



Link Configuration	
Bandwidth	30 MHz
E1/T1	None
Optimization	IP
Sync	Disabled
Symmetry	Adaptive
Dual Payload	Enabled
Lowest Ethernet Mode	BPSK 0.63 Sngl
Master	Ponto-A
Slave	Ponto-B

Installation Notes for Ponto-A	
Coordinates	23.19090S 046.87920W
Antenna Height	10.0 meters AGL
Antenna Type	Radio Waves 4ft Parabolic SP4-2/5
Spatial Diversity	5.0 meters
Bearing to Ponto-B	106.10° from True North
Antenna Tilt angle	1.5°
Link Name	Ponto-A to Ponto-B
Link Location	Ponto-A
Telecomms Interface	None
Dual Payload	Enabled
Master Slave Mode	Master
Link Mode Optimization	IP Traffic
TDD Synchronization Mode	Disabled

Installation Notes for Ponto-A (continued)	
Max Transmit Power	25 dBm while aligning 25 dBm in normal operation
Ranging Mode	Auto 0 to 40 kilometers
Platform Variant	Connectorized
Antenna Gain	34.6 dBi
Cable Loss	1.0 dB
Channel Bandwidth	30 MHz
Link Symmetry	Adaptive
Max Receive Modulation Mode	256QAM 0.81 Dual
Lowest Ethernet Modulation Mode	BPSK 0.63 Sngl
Predicted Receive Power	-70 dBm ± 15 dB while aligning
Predicted Link Loss	162.12 dB ± 14.76 dB

Installation Notes for Ponto-B	
Coordinates	23.22170S 046.76360W
Antenna Height	5.0 meters AGL
Antenna Type	Radio Waves 4ft Parabolic SP4-2/5
Spatial Diversity	5.0 meters
Bearing to Ponto-A	286.06° from True North
Antenna Tilt angle	-0.7°
Link Name	Ponto-A to Ponto-B
Link Location	Ponto-B
Telecomms Interface	None
Dual Payload	Enabled
Master Slave Mode	Slave
Link Mode Optimization	IP Traffic
TDD Synchronization Mode	Disabled
Max Transmit Power	25 dBm while aligning 25 dBm in normal operation
Ranging Mode	Auto 0 to 40 kilometers
Platform Variant	Connectorized
Antenna Gain	34.6 dBi
Cable Loss	1.0 dB
Channel Bandwidth	30 MHz
Max Receive Modulation Mode	256QAM 0.81 Dual
Lowest Ethernet Modulation Mode	BPSK 0.63 Sngl
Predicted Receive Power	-70 dBm ± 15 dB while aligning
Predicted Link Loss	162.12 dB ± 14.76 dB

Installation Instruction

Perform the following checks during the installation (Check the deployment guide and the User Guide.)

1. Check with a GPS that you are installing at the correct location.

2. Check carefully the direction to the other end of the link. Either use a corrected compass or use the GPS waypoint feature about 300 meters from the installation location.

3. When aligning antennas, it is important to find the centre of the main beam. This is done by adjusting the antenna at each end of the link in turn and monitoring the receive level until the peak is found. Once the peak level is found, it should be checked against the prediced receive power to ensure that the antennas have not been aligned on a side lobe.

4. An hour after disarm check that the mean value for the link loss is as predicted (162.12 dB ± 14.76 dB). Also check that the received power is not greater than -45dBm.

Ponto-A Performance *	
Mean IP Throughput Predicted	51.48 Mbps
Mean IP Throughput Required	5.00 Mbps
Minimum IP Throughput Required	1.00 Mbps
Minimum IP Throughput Availability Predicted	99.9992% (unavailable for 4.2 mins/year)

Ponto-B Performance *	
Mean IP Throughput Predicted	51.48 Mbps
Mean IP Throughput Required	5.00 Mbps
Minimum IP Throughput Required	1.00 Mbps
Minimum IP Throughput Availability Predicted	99.9992% (unavailable for 4.2 mins/year)

* Multipath availability calculated using ITU-R

Mode	Max Aggregate User IP Throughput (Mbps)	Ponto-A				Ponto-B			
		Max User IP Throughput (Mbps)	Fade Margin (dB)	IP Throughput Availability (%) *	Receive time in Mode (%)	Max User IP Throughput (Mbps)	Fade Margin (dB)	IP Throughput Availability (%) *	Receive time in Mode (%)
256QAM 0.81 Dual	292.56	146.28	-17.99	1.3194	1.3194	146.28	-17.99	1.3194	1.3194
64QAM 0.92 Dual	246.49	123.24	-13.40	3.6854	2.3660	123.24	-13.40	3.6854	2.3660
64QAM 0.75 Dual	201.43	100.71	-8.94	9.5467	5.8613	100.71	-8.94	9.5467	5.8613

(continued)

Mode	Max Aggregate User IP Throughput (Mbps)	Ponto-A				Ponto-B			
		Max User IP Throughput (Mbps)	Fade Margin (dB)	IP Throughput Availability (%) *	Receive time in Mode (%)	Max User IP Throughput (Mbps)	Fade Margin (dB)	IP Throughput Availability (%) *	Receive time in Mode (%)
16QAM 0.87 Dual	156.70	78.35	-3.71	25.1881	15.6414	78.35	-3.71	25.1881	15.6414
16QAM 0.63 Dual	112.65	56.32	1.97	47.2142	22.0262	56.32	1.97	47.2142	22.0262
256QAM 0.81 Sngl	146.28	73.14	-13.80	0.6293	0.6293	73.14	-13.80	0.6293	0.6293
64QAM 0.92 Sngl	123.24	61.62	-9.94	1.4462	0.8169	61.62	-9.94	1.4462	0.8169
64QAM 0.75 Sngl	100.71	50.36	-5.76	3.2961	1.8499	50.36	-5.76	3.2961	1.8499
16QAM 0.87 Sngl	78.35	39.17	-0.62	8.1057	4.8096	39.17	-0.62	8.1057	4.8096
16QAM 0.63 Sngl	56.32	28.16	5.93	96.8641	41.5441	28.16	5.93	96.8641	41.5441
QPSK 0.87 Sngl	39.17	19.59	9.27	99.6160	2.7520	19.59	9.27	99.6160	2.7520
QPSK 0.63 Sngl	28.16	14.08	14.30	99.9869	0.3709	14.08	14.30	99.9869	0.3709
BPSK 0.63 Sngl	14.08	7.04	18.41	99.9992	0.0123	7.04	18.41	99.9992	0.0123

* Multipath availability calculated using ITU-R

Regulatory Conditions	
Regulation	Brazil
Region Code	1
Max EIRP	58.60 dBm
Output Power	25.00 dBm

Part Number	Qty	Description
(no part number)	4	Radio Waves 4ft Parabolic SP4-2/5
BP5830BHC-2	1	PTP 58600 Full Connectorised (ETSI/RoW) - Link Complete
WB2907	2	LPU End Kit PTP 600 (2 kits required per Link)
WB3176	1	328 ft (100 m) Reel Outdoor Copper Clad CAT5E (Recommended for PTP)