

## LigoPTP UNITY test on a 25 km link in Hungary

LigoWave's distributor in Hungary, Accesspoint Kft., provided UNITY devices to Nicom Wireless Ltd. They configured a 25.3 kilometer link using the N-connector models of the UNITY product coupled with 90 cm (32 dBi) dish antennas from Jirous. Impressive results were achieved for such a long distance link with signal levels of -50 to -60 dBm and running on the highest modulation (64 QAM 5/6). The Mikrotik Winbox tool was used to measure the throughput and packet per second

rate. The average single direction TCP throughput was approximately 160 Mbps and the average single direction UDP throughput was nearly 170 Mbps! The comparison of the PPS rate with different packet sizes can be found in the table below. The following pages contain a LigoWave LinkCalc path analysis with satellite map illustration, and the performance screenshots from the bandwidth testing tool.

|                  | 64 bytes | 512 bytes | 1024 bytes | 2048 bytes |
|------------------|----------|-----------|------------|------------|
| Throughput, Mbps | 70       | 160       | 170        | 160        |
| PPS rate         | 140000   |           |            |            |

Table 1: Throughput results of the LigoPTP UNITY 5-N link

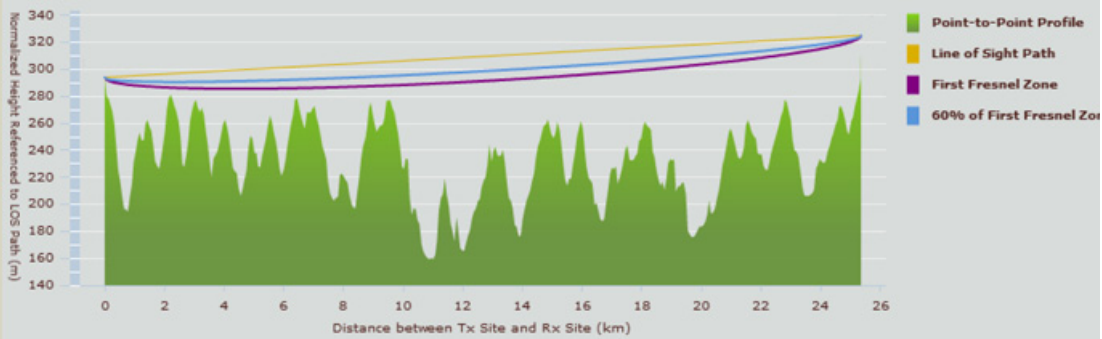
## LigoPTP UNITY

### Summary:

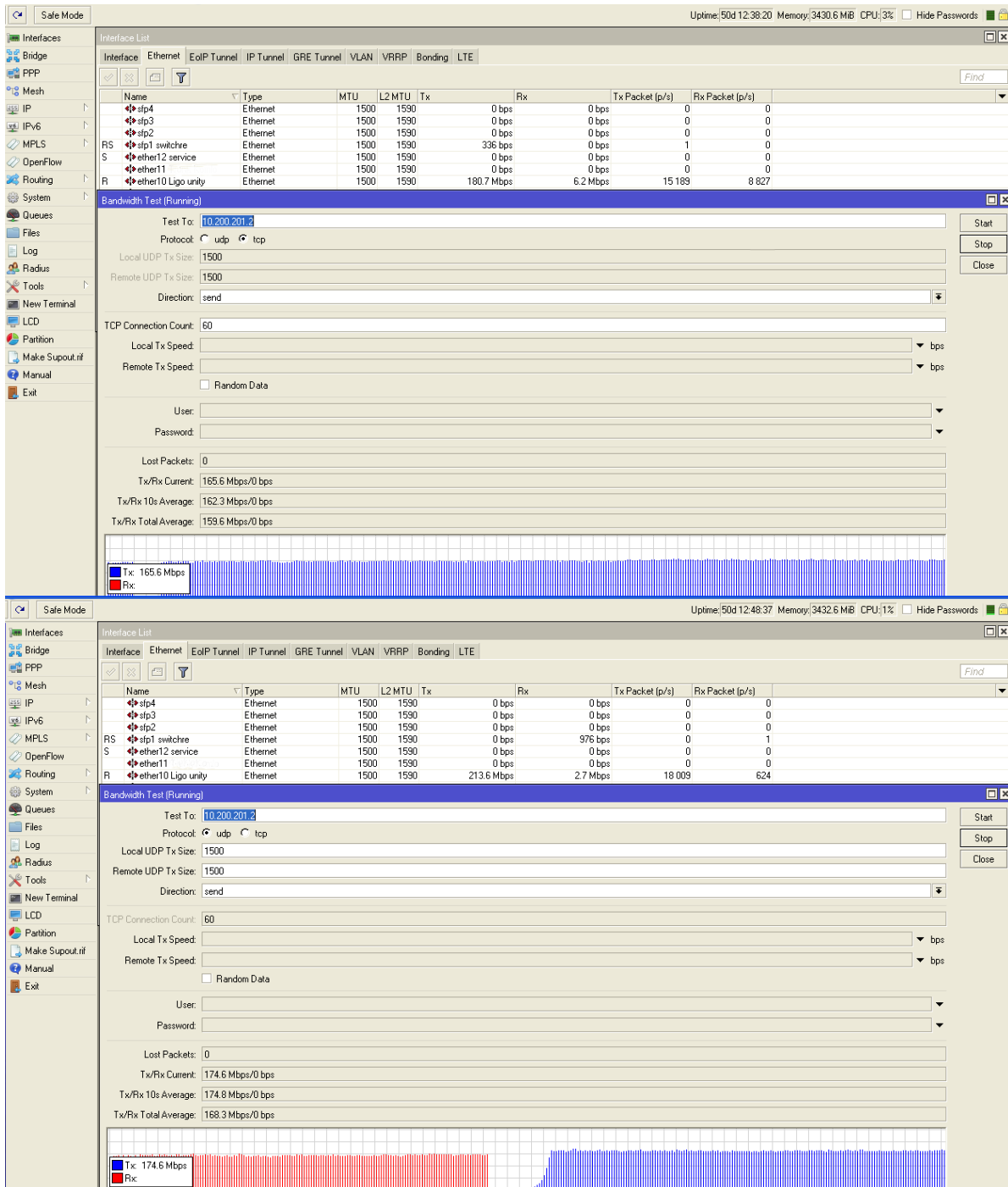
- 220 Mbps capacity
- 140000 PPS rate
- 2nd Ethernet port for wireless failover
- Wire speed QoS (L2 and L3)
- 2 x Gigabit Ethernet ports
- External OLED screen
- Integrated surge protection
- IP-67 standards rated enclosure
- Flexible and professional mounting bracket



| Site Information         |                    |                                      |                       |
|--------------------------|--------------------|--------------------------------------|-----------------------|
| <b>Tx Site Name</b>      |                    | <b>Rx Site Name</b>                  |                       |
| <b>Radio Type</b>        | LigoPTP 5-23 UNITY | <b>Radio Type</b>                    | LigoPTP 5-23 UNITY    |
| <b>Latitude</b>          |                    | <b>Latitude</b>                      |                       |
| <b>Longitude</b>         |                    | <b>Longitude</b>                     |                       |
| <b>Tx Power</b>          | 27 dBm             | <b>RX Threshold</b>                  | -95 dBm               |
| <b>Ant. Gain</b>         | 32 dBi             | <b>Ant. Gain</b>                     | 32 dBi                |
| <b>Ant. Height</b>       | 15 meters          | <b>Ant. Height</b>                   | 32 meters             |
| Parameters               |                    |                                      |                       |
| <b>Frequency</b>         | MHz                | <b>Climate</b>                       | Continental Temperate |
| <b>Ant. Polarization</b> | Vertical           | <b>Measurement</b>                   | Metric System         |
| <b>Misc. Loss</b>        | 0 dBm              | <b>Rain Rate</b>                     | 0 mm/hr               |
| Results                  |                    |                                      |                       |
| <b>Total Path Loss</b>   | 136.39 dBm         | <b>Total Fade Margin</b>             | 49.61 dBm             |
| <b>RX Signal Level</b>   | -45.39 dBm         | <b>Distance between sites</b>        | 25.35 km              |
| <b>EIRP</b>              | 59 dBm             | <b>Link availability due to rain</b> | N/A                   |



Picture 1: Link path analysis and satellite map illustration



Picture 2: Screenshot from the bandwidth testing tool

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