



## LaserFire®

*Free Space Optical Communications Terminal*



### Space Photonics'® LaserFire® Free Space Optical

Communications Terminals incorporate our patented beam pointing, acquisition, and tracking (PAT) technique. The system provides unprecedented PAT bandwidth and resolution in a low cost, low power product. The enormous benefit of this technology is the elimination of heavy, power hungry gimbals, as well as providing a very low mass approach that does not "shake" the platform as gimbals do, whether it be a satellite, UAV, tank, or tower.

Operating at speeds from 1 Gbps to 10 Gbps, LaserFire® systems have a fast deployment time (mobile setups can be up and running in under 15 minutes) without requiring government permits or right-of-way for installation. Whether for a service provider, enterprise customer, or military unit, the LaserFire® product will provide the robust bandwidth needed for any application.

### The Free Space Optics Advantage:

#### Ultra High Wireless Bandwidth

- We can provide either a full gigabit interface link, or can accept fiber input/output pairs of single mode 1550nm. Our system does not depend on the data being transmitted to provide its tracking; we work purely on the optical intensity, and are therefore not limited to a particular bandwidth or protocol.

- Standard installation bandwidth: Gigabit Ethernet.

#### Push Button Acquisition

- Our system has fully automatic acquisition and tracking sequences, so a tech only has to rough align units to within 5 degrees and push the start button for each terminal to find its partner and establish a link. Current FSO solutions have to be carefully aligned with telescopes to establish a link.

- Standard installation acquisition time: Under 10 minutes for initial acquisition, seconds for repeated acquisition.

#### Tracking

- Current FSO solutions are stationary links between two rigidly mounted terminals. This is not a robust solution because as the building sways in the wind, expands or contracts through seasonal temperature changes, or shifts for any other reason, the link can lose alignment, eventually losing the connection completely. Our system is continually realigning itself to maintain an optimal link between the units.

- Standard Installation tracking capabilities:

Rates up to 8 m/s for each km of range, while maintaining a bit error rate (BER) of 1E-10 with service reliability of 99.999%.

- Rates up to 14 m/s for each km of range, while maintaining a position lock on target.



## Small Size, Weight, and Power

- Our current system weight approximately 10 pounds
- Less than 1/4th cubic foot
- Consumes approximately 15 Watts

## One size fits all

- Our current system is designed to work anywhere from 6 meters to 2.5 kilometer
- Currently under development is a system to cover up to 10 kilometers.

## Chaining

- The LaserFire® systems can be chained together for non line of sight or longer link distances. The chain node only needs a power source; no network or computer systems are required.

## Security

■ Current FSO solutions use a large beam size to account for small shifts in the building to maintain their links. This introduces a security risk because anyone that has one of the same terminals could intercept the beam in such a way that the original link is still connected as well. Our system uses a highly collimated beam that is approximately the size of our terminal. If anyone tried to intercept part of our beam, our system would register the loss in power and automatically move the beam. Also, since our terminals use low power infrared lasers, it is impossible to know where the beam is at all times.

## Multi Protocol Compatible

■ The LaserFire® system is only dependant on having a single mode 1550nm optical source. Any network hardware that has such a fiber output, regardless of protocol, can be used for our system. We can also provide an intelligent gateway to invisibly convert between protocols.

## Safe To Use

■ All LaserFire® systems are eye and skin safe at the aperture and meet class 1M laser standards, ANSI Z136.1 – 2007.

## Cost Savings

- With LaserFire®, you own the hardware. It can be moved around, resold, rented to others, etc.

## Simple Hookup

■ The only connections on the outside of the unit are a 48V power, USB for unit control, CAT6 for communications, and a power switch.