

# NetLight<sup>®</sup>

## The Most Comprehensive Free Space Optic Wireless Solution

NetLight provides ultra high bandwidth using a technology similar to that found in fiber optics communications, providing full-wire data rate using optical signals. In addition, the narrow and invisible laser beam makes it the most secure wireless solution, nearly impossible to intercept.

NetLight systems, without the need for right-of-way or government permits for installation, provide a licence-free technology.



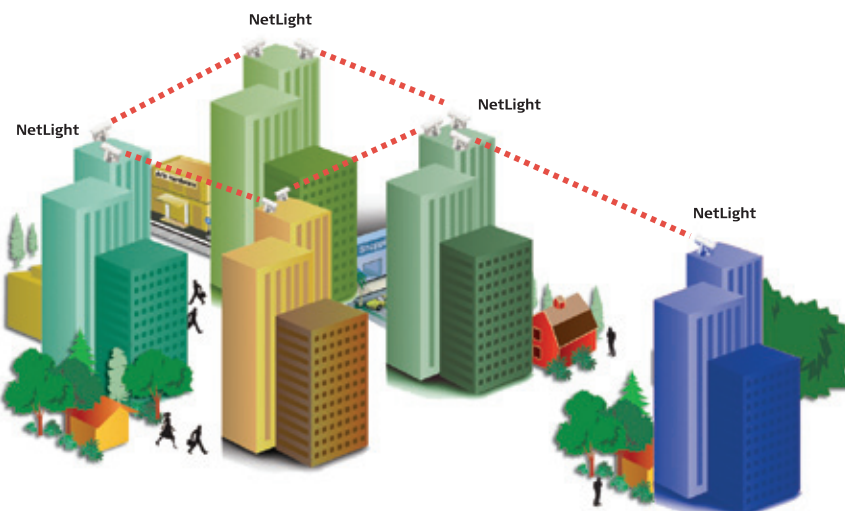
### Providing high-speed fiber-speed with wireless flexibility

The NetLight family of Free-Space Optics (FSO) products provides cost-effective, high-speed wireless connectivity for a variety of applications, such as: Enterprise connectivity, Voice & Data, Video and Entertainment, Telco Bypass, Disaster Recovery, Surveillance and Government, Backhaul for wireless mesh.

Whether you need narrowband voice and/or broadband data, our products provide scalable, wireless solutions at fiber speed.

Operating at data rates of 1.5 Mbps to 1.25 Gigabit speeds, NetLight systems deployment is in fact, without requiring right-of-way or government permits for installation, providing you with flexible high bandwidth, secure communication.

Whether you are a Service Provider or an Enterprise customer, the NetLight family of products can provide you with the data rate, performance and reliability that you need in a communications network.



### Product Highlights

- Ultra High Bandwidth
- Rapid Deployment Time
- Secure Transmission
- Protocol Compatible
- Safe to use
- Complements Other Technologies
- Major Cost Savings
- Licence free operation



## The Free Space Optics Advantage

### Ultra High Wireless Bandwidth

The components used in FSO technology are similar to those found in fiber optic system. Therefore, FSO gives you the high data rates previously provided only by fiber optics.

### Rapid Deployment Time

NetLight units are small, portable devices that resemble security cameras. Their portability, combined with license free operation, means that once a site is ready it only takes a few hours to have your link up and running.

### Secure Transmission

The beam that transmits your data is very narrow and invisible, making it nearly impossible to intercept.

### Protocol Compatible

FSO links work with a variety of protocols. Protocols such as: Ethernet, Fast Ethernet, Gigabit Ethernet, FDDI, ATM, and ESCON can all be transmitted through NetLight with no issues.

### Safe to use

All models of NetLight are eye and skin safe at aperture.

### Complements Other Technologies

FSO complements the current copper/fiber/microwave/LMDS communication infrastructure by adding significantly to the overall bandwidth and shortening the time to market by providing this bandwidth immediately.

### Major Cost Savings

With NetLight links, you own your bandwidth. Avoiding the recurring costs of leased lines and licensing costs, your return on investment can be realized in just a few months.

### License Free Operation

No need to obtain frequency licenses for the operators of NetLight's FSO wireless solutions.

## NetLight Advantages

In addition to incorporating all of the FSO advantages, NetLight offers unique innovated features including:

- Multiple transmit apertures technology: The NetLight products use a multiple transmit apertures technology to ensure high performance under adverse weather conditions. The receivers are designed to overcome scintillation and other atmospheric noises in hot or cold weather.
- Easy installation.
- A look-back camera to ensure accurate alignment.
- RF backup systems for a number of the NetLight products, offering carrier-class availability (99.999%) in all types of weather, including heavy fog and rain.
- All NetLight products use a multiple transmit apertures technology to ensure high performance under adverse weather conditions. The receivers are designed to overcome scintillation and other atmospheric noises in hot or cold weather.
- All NetLight systems are extremely reliable with a MTBF (Mean Time Between Failures) of more than 10 years.
- All our midrange systems are equipped with our special internal air circulation features, based on dissipation of the power supply heat. This prevents the formation of condensation on the lenses under all weather conditions without the need for additional heating at low temperatures.

## Features

- Alignment using both visual feedback and received power indicators
- Fast deployment
- Licence-free operation
- Remote management options
- Weatherproofing: IP66
- Secure transmission
- Eyes safety Class 1M
- Chain multiple connections

## Applications

- Enterprise connectivity indicators
- Mesh networking
- Voice & Video connections
- Carrier bypass
- Surveillance
- Government
- Temporary installation
- Cross Border Links
- Healthcare
- Fiber Backup
- Business Continuity



## NetLight G-2300

### The NetLight that never tires

The carrier class NetLight G-2300 operates data rates of 2 Mbps to 1.25 Gbps.

NetLight G-2300 systems are used for medium distances and support a wide variety of protocols at full duplex at wire-speed. NL/G-2300 exists in the following models: E1/T1, 4 x E1/T1, Fast Ethernet and Gigabit Ethernet.

NetLight G-2300, like all NetLight units, are deployable within a matter of hours.

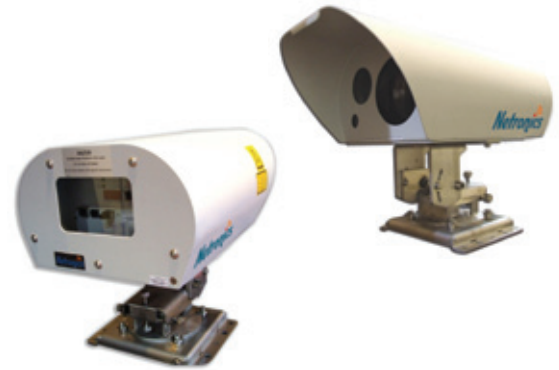
NL/G-2300 supplies a connectivity that reaches up to 4.1 km and supports various protocols.

The NL/G-2300 has two transmitters and an 8" RX lens - these features almost eliminate any scintillation influence and enhance the transceiver's reliability.

The NL/G-2300 is specially recommended for Voice Connectivity - E1/T1 & 4 x E1/4T1 solutions even for short distances.

## Features

- Accommodates Gigabit Ethernet, Fibre Channel, Fast Ethernet, E1/T1 and 4 x E1/4T1 protocols
- Distances of up to 2.3 km
- Built-in-dry contacts
- SNMP -optional (in NL/G-2300 the SNMP IS included)



## NetLight G-2300 Technical Specifications

Model	NL/G-2300		
Applications / Data Protocol	Gigabit-Ethernet, Fiber Channel		
Performance	Rate	1.0625 Gbps & 1.25 Gbps	
	Range @ 3 dB/km	2300 m	
	@ 5 dB/km	1800 m	
	@ 10 dB/km	1300 m	
	@ 17 dB/km	950 m	
	@ 30 dB/km	650 m	
	Minimum Range	100 m	
	Bit error rate	Less than 1 E - 12 (unfaded)	
	MTBF	10 years	
	Transmitter	Light source	2 VCSEL
Wavelength		830 - 860 nm	
Total Output power		30 mW	
Beam divergence		3 mrad	
Receiver	Detector	APD	
	Field of view	2.5 mrad	
	Sensitivity	-33 dBm	
Interface	Type	Factory set: 100 - 240 VAC @ 50/60 Hz or 35 - 60 VDC (V3 versions)	
	Connectors	SC(other connectors available)	
	Cable	Up to 220 m length @ 62.5 um & Up to 5000 m length @ 50 um	
	Wavelength	-	
	Output power	-	
	Receiver operating range	-	
Power Supply	Voltage range	Factory set: 100 - 240 VAC @ 50/60 Hz or 35 - 60 VDC (V3 versions)	
	Power consumption	15 W	
Environmental Information	Operating temperature	-30 ° C to +50 ° C	
	Storage temperature	-50 ° C to +70 ° C	
	Humidity	95% non-condensing	
	Housing	Weatherproofing: IP66	
	Eye safety Class	1 M	
Mechanical Design	Dimensions (mm)	790 x 390 x 556 (JAH-8+JMP-8: 185 X 235 X 165)	
	Weigh	Unit	13 kg
		Accessories	13 kg
Diagnostics	Indicators	Airlink: Flag, Fiber Optic: Flag, Laser enabled, Receive Signal Strength (Digital Display)	
	Selectors	Data rate, power attenuator (for short distance), IP address setting	
Management	SNMP protocol - Built-In 4 dry contacts for: airlink flag, fiber optic flag, laser enabled and power		

@ 3 dB/km = Light rain (5-10 mm/hr) - Light haze  
 @ 5 dB/km = Light to medium rain (15-20 mm/hr) - Haze  
 @ 10 dB/km= Medium to heavy rain (45 mm/hr) - Light snow - Thin fog  
 @ 17 dB/km= Cloudburst (100 mm/hr) - Medium snow - Light fog  
 @ 30 dB/km= Rain (up to 180 mm/hr) - Blizzard - Moderate fog



## NetLight G-1000/100-880

### High Bandwidth - Short Distances - Excellent Price/Performance

The NL/G-1000 series provides high speed Free Space optics (FSO) connectivity for a variety of first mile applications. Operating at full wire speed data rates of 1 Mbps to 1.25 Gbps, the NL/G-1000 series is rapidly deployable, without requiring right-of-way or government permits for installation, providing you with communication links in hours instead of weeks or months.

The NL/G-1000 is high quality product specially designed for short distance connections reaching distances of up to 1000 meters at the best price performance ratio possible.

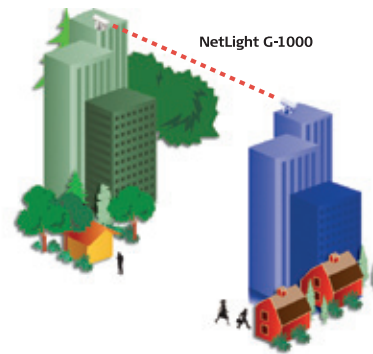
The NL/G-1000 has two models: NL/100-880, NL/G-1000.

A standard NL/100-880 has 4 operational modes: E3, T3, Fast Ethernet and OC3 (155 Mbps). It is possible to order optional open protocol or customized protocol (should be specified in the order).

The NL/G-1000 operates at Gigabit Ethernet and Fiber Channel.

## Features

- Accommodates 1.0625 & 1.25 Gbps networks, for protocol such as: Fibre Channel and Gigabit Ethernet, or 1 to 155 Mbps networks, for protocols such as: E3/T3, Fast Ethernet, FDDI, ATM, OC- 3 and STM-1
- PoE (power over Ethernet) in the NL/100-880
- Distances up to 4000 m
- Built-in- dry contacts
- SNMP-optional (in NL/100-880 the SNMP is included)



### NetLight G-1000 & NetLight 100-880 Technical Specifications

Model	NL/100-880	NL/G-1000
<b>Applications / Data Protocol</b>	Fast Ethernet	Gigabit-Ethernet, Fiber Channel
<b>Performance</b>		
Rate	100 Mbps	1.062 Gbps & 1.25 Gbps
Range @ 3 dB/km	880 m	1100 m
@ 5 dB/km	770 m	950 m
@ 10 dB/km	600 m	730 m
@ 17 dB/km	480 m	570 m
@ 30 dB/km	360 m	425 m
Minimum Range	10 m	10 m
Bit error rate	Less than 1 E - 12 (unfaded)	
MTBF	10 years	
<b>Transmitter</b>		
Light source	1 VCSEL	
Wavelength	830 - 860 nm	
Total Output power	5 mW	16 mW
Beam divergence	3 - 4 mrad	
<b>Receiver</b>		
Detector	Silicon Photodiode	APD
Field of view	14 mrad	8 mrad
Sensitivity	-34 dBm	-33 dBm
<b>Interface</b>		
Type	Electrical - 100 Base Tx	SFP - Multimode (Single mode available upon request)
Connectors	RJ 45	LC
Cable	STP	Up to 220 m length @ 62.5 um & Up to 5000 m length @ 50 um
Wavelength	850 nm (other wavelengths available)	
Output power	-4 to -9.5 dBm	
Receiver operating range	0 to -17 dBm	
<b>Power Supply</b>		
Voltage range	Factory set: 100 - 240 VAC @ 50/60 Hz or 35 - 60 VDC PoE (Power over Ethernet): In V3 version (Low voltage)	Factory set: 100 - 240 VAC @ 50/60 Hz or 35 - 60 VDC (V3 versions) (15 W)
Power consumption	-50 ° C to +60 ° C	15 W -30 ° C to +50 ° C
Operating temperature	-50 ° C to +70 ° C	
Storage temperature		
Humidity	95% non-condensing	
Housing	Weatherproofing: IP66	
Eye safety Class	1 M	
<b>Mechanical Design</b>		
Dimensions (mm)	470 x 282 x 355	
Weight	Unit	5 kg
	Accessories	5 kg
<b>Diagnostics</b>		
Indicators	Airlink: Link, Data 100Base Tx: Link, Data, Loopback, Receive Signal Strength (Digital Display)	Airlink: Flag, Fiber Optic: Flag, Laser enabled, Loopback mode, Fusion mode and activity, Software mode, Management Tx and Rx, F/O Redundant Flag Receive Signal Strength (Digital Display)
Selectors	Alignment, Loopback (local), IP address, Data Transmission	Loopback (local), Power attenuator (for short distance), Data Rate, Fusion, IP address, Control Mode
Diagnostic	2 dry contacts (Airlink and FO Link)	4 dry contacts for: Airlink Flag, Airlink Laser enabled, Fiber Optic Flag and Power
<b>Management</b>	SNMP protocol - Optional P.N with SNMP: NL100-880	SNMP protocol - Built-In



## NetLight G-3500/155-5400

### Going the farthest with modular design

The carrier class NL/G-3500 provides long distance high speed Free Space Optics (FSO) connectivity. Operating at data rates of 1 Mbps to 1 Gigabit, NL/G-3500 systems are deployable rapidly, providing long distance FSO optical wireless connectivity. The NL/G-3500 exists in the following models: Ethernet, 4 x E1/T1, 155 Mbps and Gigabit.

NL/G-3500 uses multiple transmit aperture technology (3 transmitters) to ensure high performance in adverse weather conditions. The receiver of the long-range NL/G-3500 has an 8" diameter to overcome scintillation and other atmospheric noises in hot or cold weather.

In addition to the formerly existing modular power supply, the improved model of NL/G-3500 has another power supply, which noticeably improves the MTBF (available only in NL/G-3500 and NL/G155-5400 models). When one of the power supplies breaks down, the other one continues to operate normally and transparently. The customer will only see on the back panel or on the MegaVision screen that one of the power supplies stopped working. The power supply modularity allows for replacing the faulty power supply without interrupting the normal operation of the link.

The NL/G-3500 series also has a modular interface, i.e. the transceiver can be easily modified in the field from multimode to single mode or from 850 nm to 1300 nm (available only in NL/G-3500 and NL/G-155-5400 models).

An additional advantage of the transceiver modularity is the possibility to add the Fusion option in the field in case this option has not been previously purchased.

### Features

- Accommodates 1Mbps to 1.5 Gigabit networks, for protocols such as Ethernet, 4 x E1/T1, Fast Ethernet, ATM, Gigabit Ethernet, Storage
- Supports multiple protocols: E3/T3, Fast and Gigabit
- Ethernet, FDDI, OC-3, ATM and STM-1, Fiber Channel
- Distances up to 6.7 Km
- SNMP Built-in
- Connection to dry contact management box (RSM-DC) optional
- Connection to RSM box
- FUSION option - Fail-over to radio backup
- Modular network connectivity (interface)
- Modular Power Supply

### NetLight G-3500 & NetLight 155-5400 Technical Specifications

Model	NL155 - 5400	NLG-3500
<b>Applications / Data Protocol</b>	Fast Ethernet, ATM, OC3, STM1, SMPTE, E3, T3, OC1/STM0 & Open Protocol	Gigabit-Ethernet, Fiber Channel
<b>Performance</b>	Rate 1 - 155 Mbps	1,062 Gbps & 1,25 Gbps Not attenuated. (3TXs)    Attenuated (2TXs)
	Range @ 3 dB/km	5400 m    3500 m    3100 m
	@ 5 dB/km	4080 m    2750 m    2500 m
	@ 10 dB/km	2650 m    1850 m    1650 m
	@ 17 dB/km	1820 m    1300 m    1200 m
	@ 30 dB/km	1185 m    870 m    820 m
	Minimum Range	450 m    700 m    500 m
	Bit error rate	Less than 1 E - 12 (unfaded)
	MTBF	10 years
<b>Transmitter</b>	Light source	3 x Lasers
	Wavelength	830 - 860 nm
	Total Output power	85 mW    70 - 120 mW
	Beam divergence	2 mrad
<b>Receiver</b>	Detector	APD
	Field of view	2 mrad
	Sensitivity	-46 dBm    -33 dBm
<b>Interface</b>	Type	Fiber Optic Transceiver - Multimode (Singlemode available upon request)
	Connectors	SC (other connectors available)
	Wavelength	1310 nm (other wavelength available)    850 nm (other wavelength available)
	Output power	-17 ± 3 dBm    -4 to -9,5 dBm
	RX operating range	-14 to -30 dBm    0 to -17 dBm
<b>Power Supply</b>	Voltage range	Factory set: 100 - 240 VAC @ 50/60 Hz or 35 - 60 VDC (V3 and F3 versions)
	Power consumption	30 W
<b>Environmental Information</b>	Operating temperature	-30 ° C to +60 ° C
	Storage temperature	-50 ° C to +70 ° C
	Humidity	95% non-condensing
	Housing	Weatherproofing: IP66
	Eye safety Class	1 M
<b>Mechanical Design</b>	Dimensions (mm)	790 x 390 x 556 (AD-5000: 250 X 353 X 432)
	Weight	14 kg
	Accessories	21,5 kg
	Modularity	Modular Power supply, Modular Interface Redundant Power supply - optional
<b>Diagnostics</b>	Indicators	Airlink: Flag, Sync., Fiber Optic: Flag, Sync. Alignment, Loopback, Fusion: Enabled/Active, Heating status (if exists), Control mode: Hardware mode or Software mode. Power supply status, Heating active, Receive Signal Strength (digital Display), Lasers status (3 LEDs), SNMP TX and RX
	Selectors	Data Rate, Alignment, Loopback (local), Remote loopback, Laser status, Fusion activation, Heating activation (if exist), IP address setup, Control mode.    Alignment, Loopback (local), Remote loopback, Fusion activation, Signal attenuation for short distance, Heating activation (if exist), IP address setup, Control mode.
<b>Management</b>		SNMP protocol - Built-in Two pairs of Pins of the management RJ45 connector can be used for dry contact purposes, for Airlink flag and F/O flags alarm



## NetLight 155-1900

### The Strong and compact NetLight

The NL/155-1900 is a solution with an innovative and compact design.

The NL/155-1900 is a high quality product designed for the medium range connections reaching distances of up to 1900 meters.

The NL/155-1900 supports most of the prevalent protocols in the 34-155 Mbps range.

Support for a special protocol, which is not on the list, can be ordered after coordination with Netronics. This Model can be used for Open Protocol applications, thus ensuring complete transparency (including all data in the range of 1-155 Mbps.)

## Features

- Data rate between 1-155 Mbps
- Supports protocols: E3/T3, 4 x E1/T1, Ethernet, Fast Ethernet FDDI, OC-3, ATM and STM-1
- Distances of up to 1900 m
- SNMP - Optional
- Connection to dry contact management box (RSM-DC) - optional
- Connection to RSM box
- FUSION option - Failover to radio backup

## NetLight 155-1900 Technical Specifications

Model	NL/155-1900		
Applications / Data Protocol	Fast Ethernet, ATM, OC3, STM1, SMPTE, E3, T3, OC1/STM0 & Open Protocol		
<b>Performance</b>	Rate	1-155 Mbps	
	Range @ 3 dB/km	1900 m	
	@ 5 dB/km	1600 m	
	@ 10 dB/km	1150 m	
	@ 17 dB/km	850 m	
	@ 30 dB/km	600 m	
	Minimum Range	10 m	
<b>Transmitter</b>	Bit error rate	Less than 1E-12 (unfaded)	
	MTBF	10 years	
	Light source	1 laser	
<b>Receiver</b>	Wavelength	830-860 nm	
	Total Output power	28 mW	
	Beam divergence	3 mrad	
	Detector	Silicon Photodiode	
<b>Interface</b>	Field of view	14 mrad	
	Sensitivity	-37 dBm	
	Type	Fiber Optic Transceiver - Multimode (Single mode available upon request)	
<b>Power Supply</b>	Connectors	SC (other connectors available)	
	Wavelength	1300 nm (other wavelength available)	
	Output power	-17 ± 3 dBm	
	Receiver operating range	-14 to -30 dBm	
	Voltage range	Factory set: 100 - 240 VAC @ 50/60 Hz or 35 - 60 VDC (V3 and F3 versions)	
<b>Environmental Information</b>	Power consumption	18 W	
	Operating temperature	-50 ° C to +60 ° C	
	Storage temperature	-50 ° C to +70 ° C	
	Humidity	95% non-condensing	
	Housing	Weatherproofing: IP66	
<b>Mechanical Design</b>	Eye safety Class	1 M	
	Dimensions (mm)	470 x 282 x 355	
	Weigh	Unit	5 kg
		Accessories	5 kg
<b>Diagnostics</b>	Indicators	Airlink: Flag, Sync., Fiber Optic: Flag, Sync, Alignment, Loopback mode, Fusion mode and activity, Software mode, Laser status, Management Tx and Rx	
	Selectors	Data Rate, Alignment, Loopback (local), Remote loopback, Laser status, Fusion activation, Heating activation (if exist), IP address setup, Control mode.	
<b>Management</b>	SNMP protocol - Built-in Two pairs of Pins of the management RJ45 connector can be used for dry contact purposes, for Airlink flag and F/O flags alarm		

- @ 3 dB/km = Light rain (5-10 mm/hr) - Light haze
- @ 5 dB/km = Light to medium rain (15-20 mm/hr) - Haze
- @ 10 dB/km = Medium to heavy rain (45 mm/hr) - Light snow - Thin fog
- @ 17 dB/km = Cloudburst (100 mm/hr) - Medium snow - Light fog
- @ 30 dB/km = Rain (up to 180 mm/hr) - Blizzard - Moderate fog



Netronics Technologies Inc.  
600-15 Allstate Parkway  
Markham, Ontario, L3R 5B4,  
Canada  
Tel: + 1 (905) 415 4585  
Fax: + 1 (416) 352 5720

Middle East Office  
P.O.Box 29650, Dubai, U.A.E  
Tel: + (9714) 358 32 35  
Fax: + (9714) 358 32 36

