



SONaBEam™

SONA
OPTICAL WIRELESS

SONABEAM FROM FSONA

At fSONA, we deliver optical wireless connectivity solutions that bridge network gaps with unmatched simplicity and performance. From point-to-point connectivity to meshed networking architectures, the SONAbeam's protocol transparent technology gives military, government, service providers and enterprise customers alike the unique ability to integrate free space optics (FSO) quickly and easily into any existing network.

By transmitting through the atmosphere, the SONAbeam eliminates the substantial costs of digging up streets and sidewalks required to install fiber, and unlike other wireless solutions, the SONAbeam is immune to electro-magnetic (EM) and radio-frequency (RF) interference, as well as offering the benefit of eliminating the requirement for costly spectrum licenses. Plus; the SONAbeam's narrow, highly directional transmission all but eliminates eavesdropping or interception. Utilizing advanced FSO technology at the eye-safe 1550 nm wavelength, fSONA has created the most potent FSO systems ever brought to market.

FORWARD THINKING IN FREE SPACE OPTICS (OPTICAL WIRELESS)

Key to SONAbeam's breakthrough laser technology is its operational wavelength of 1550 nm, which provides a broad spectrum of safety and performance advantages. Wavelengths longer than 1400 nm are safe to the human eye. Thus the SONAbeam is a true eyesafe platform that meets ANSI Class 1 and IEC Class 1M safety standards. Already operating with the highest output power levels in the industry, the SONAbeam still has room to grow; thanks to the benefits of the 1550 nm wavelength.

SECURE WIRELESS

In today's environment, network security is critical to an organization's survival. The vulnerabilities of RF systems have led people to wrongly conclude that all wireless transmissions are highly vulnerable to interception. The SONAbeam's FSO technology is among the most secure of any wide-area connectivity solution; this is due to its inherent low probability of interception, its anti-jam characteristics and the stealth nature of the transmission.



RUGGED AND ROBUST

At fSONA, we explored every possible design consideration to ensure the SONAbeam transceivers are able to survive in even the most extreme weather conditions - from the intense cold of the north, to the blazing desert sun. The SONAbeam's superior environmentally sealed, cast-aluminum housing, is unique in the market and is impervious to water, sun and other environmental hazards. Its support infrastructure is rigid enough to maintain stability in winds up to 120 km/h and survive driving gales of up to 160 km/h, allowing for problem-free rooftop and tower installations. The SONAbeam has also been designed to operate through windows, again furthering the available deployment options.

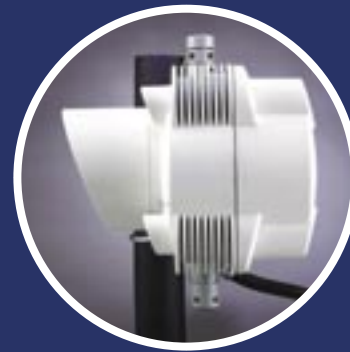
THE MOST RELIABLE PART OF YOUR NETWORK

Thorough product testing is one of the cornerstones of our business, and we consider our testing procedures to be the most rigorous in the industry. To ensure complete reliability throughout the SONAbeam's internal systems, we select and design the electronics to not only utilize the best components available, but to ensure these components operate at the lowest possible stress levels. We then subject every component and every subsystem to a battery of laboratory and real-world tests to confirm the integrity of our design.

CARRIER-CLASS AVAILABILITY

The SONAbeam's high-powered laser transmitters are able to penetrate heavy rain, snow and fog far more effectively and consistently than any other available FSO technology. The ability to deliver the industry's highest link margins makes the SONAbeam ideal for use in hybrid networks; using complementary technologies to create fully protected, fully redundant, multi-media solutions - a requirement in today's networks. With up to four redundant transmitters, the SONAbeam produces up to 640mW of output power; 30-50 times more transmission power than most competing FSO products. With greater power comes enhanced weather penetration capabilities and more effective transmission over longer ranges.

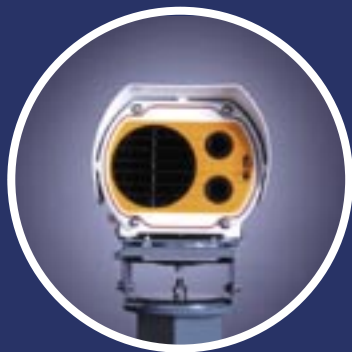




	SONABEAM 1250-M	SONABEAM 155-M
Transmission rates	100 - 1448 Mbps (datarate transparent and relocked)	31 - 180 Mbps (datarate transparent and relocked)
Transmission standards	OC-3/STM-1, OC-12/STM-4, 270 Mbps, 1064 Mbps, Fast/Gig Ethernet	OC-3/STM-1, Fast Ethernet
Range: 3 dB/km (clear air)	400 m to 5300 m (1310 ft to 3.3 mi)	300 m to 6400 m (980 ft to 4.0 mi)
10 dB/km (extreme rain)	400 m to 2325 m (1310 ft to 1.4 mi)	300 m to 2675 m (980 ft to 1.7 mi)
Laser output power	560 mW peak (4 x 140 mW)	640 mW peak (4 x 160 mW)
Fiber xmtr output power	-11 dBm (min), -3 dBm (max)	-15 dBm (min), -8 dBm (max)
Fiber rcvr input power	-20 dBm (min), -3 dBm (max)	-31 dBm (min), -8 dBm (max)
Receive aperture	20 cm (8 in) diameter, effective clear	20 cm (8 in) diameter, effective clear
	SONABEAM 622-M	SONABEAM 52-M
Transmission rates	100 - 715 Mbps (datarate transparent and relocked)	10 - 68 Mbps (datarate transparent and relocked)
Transmission standards	OC-3/STM-1, OC-12/STM-4, 270 Mbps, Fast Ethernet	E3, DS3, OC-1/STM-0
Range: 3 dB/km (clear air)	400 m to 5400 m (1310 ft to 3.4 mi)	300 m to 7700 m (980 ft to 4.8 mi)
10 dB/km (extreme rain)	400 m to 2350 m (1310 ft to 1.5 mi)	300 m to 3125 m (980 ft to 1.9 mi)
Laser output power	560 mW (4 x 140 mW)	640 mW peak (4 x 160 mW)
Fiber xmtr output power	-11 dBm (min), -3 dBm (max)	-15 dBm (min) to -8 dBm (max)
Fiber rcvr input power	-20 dBm (min), -3 dBm (max)	-31 dBm (min) to -8 dBm (max)
Receive aperture	20 cm (8 in) diameter, effective clear	20 cm (8 in) diameter, effective clear
FIBER-OPTIC INTERFACE		
Interface type	SM or MM fiber, SC terminated	
Fiber xmtr wavelength	1310 nm nominal (1280 nm to 1335 nm)	
Fiber rcvr wavelength	1310 nm nominal (1280 nm to 1335 nm)	
MECHANICAL / ELECTRICAL / ENVIRONMENTAL		
Operating temperature	-40°C to 60°C (-40°F to 140° F)	
Solar filters	2 spatial, 2 spectral	
Pointing stability	120 km/h (75 mph) operating, > 160 km/h (100 mph) survivability	
Environmental seal	Water-tight, IP66 + NEMA-4 rated	
Dimensions (W*H*D)	Centimeters: 41 x 41 x 46; Inches: 16 x 16 x 18	
Weight - kg (lbs)	Head: 20 kg (44 lbs); PCA: 8 kg (17 lbs); Yoke: 8 kg (17 lbs)	
Input voltage	-48v DC nominal, Operational range (-40v to -57v)	
Optional AC	External AC supply available: 85-260 VAC (50/60 Hz)	
Power consumption	Transceiver: 55 watts, max; Heaters: 200 watts, max	
CARRIER-CLASS RELIABILITY AND DURABILITY		
Heating	Internal, to 30°C (86°F), prevents optics fogging, snow/sleet accumulation	
Laser cooling	Active solid state cooling to 35°C (95°F), even in desert conditions	
Redundant transmitters	4 independent lasers, drivers, coolers & cooler controllers	
Power supply	Carrier-grade, 2 million hour MTBF for DC	
Structure	Cast aluminum housing, yoke & mount	
Adaptive power control	Adjusts laser power to changing weather conditions	



	SONABEAM 1250-S	SONABEAM 155-S
Transmission rates	100 - 1448 Mbps (datarate transparent and reclocked)	31 - 180 Mbps (datarate transparent and reclocked)
Transmission standards	OC-3/STM-1, OC-12/STM-4, 270 Mbps, 1064 Mbps, Fast/Gig Ethernet	OC-3/STM-1, Fast Ethernet
Range: 3 dB/km (clear air)	100 m to 3600 m (330 ft to 2.0 mi)	100 m to 4450 m (330 ft to 2.8 mi)
10 dB/km (extreme rain)	100 m to 1710 m (330 ft to 1.1 mi)	100 m to 2000 m (330 ft to 1.25 mi)
Laser output power	280 mW (2 x 140 mW)	320 mW (2 x 160 mW)
Fiber xmtr output power	-11 dBm (min), -3 dBm (max)	-15 dBm (min), -8 dBm (max)
Fiber rcvr input power	-20 dBm (min), -3 dBm (max)	-31 dBm (min), -8 dBm (max)
Receive aperture	10 cm (4 in) diameter, effective clear	10 cm (4 in) diameter, effective clear
SONABEAM 622-S		
Transmission rates	100 - 715 Mbps (datarate transparent and reclocked)	
Transmission standards	OC-3/STM-1, OC-12/STM-4, 270 Mbps, Fast Ethernet	
Range: 3 dB/km (clear air)	100 m to 3800 m (330 ft to 2.4 mi)	
10 dB/km (extreme rain)	100 m to 1720 m (330 ft to 1.1 mi)	
Laser output power	280 mW (2 x 140 mW)	
Fiber xmtr output power	-11 dBm (min), -3 dBm (max)	
Fiber rcvr input power	-20 dBm (min), -3 dBm (max)	
Receive aperture	10 cm (4 in) diameter, effective clear	
FIBER-OPTIC INTERFACE		
Interface type	SM or MM fiber, SC terminated	
Fiber xmtr wavelength	1310 nm nominal (1280 nm to 1335 nm)	
Fiber rcvr wavelength	1310 nm nominal (1280 nm to 1335 nm)	
MECHANICAL / ELECTRICAL / ENVIRONMENTAL		
Operating temperature	-40°C to 60°C (-40°F to 140°F)	
Solar filters	2 spatial, 2 spectral	
Pointing stability	120 km/h (75 mph) operating, > 160 km/h (100 mph) survivability	
Environmental seal	Water-tight, IP66 + NEMA-4 rated	
Dimensions (W*H*D)	Centimeters: 40 x 40 x 36; Inches: 16 x 16 x 14	
Weight - kg (lbs)	Head: 17 kg (37 lbs); Mount: 6 kg (13 lbs)	
Input voltage	85-260 VAC (50/60 Hz)	
Power consumption	Transceiver: 40 watts, max; Heaters: 200 watts, max	
CARRIER-CLASS RELIABILITY AND DURABILITY		
Heating	Internal, to 25°C (77°F), prevents optics fogging, snow/sleet accumulation	
Laser cooling	Active solid state cooling to 35°C (95°F), even in desert conditions	
Redundant transmitters	2 independent lasers, drivers, coolers & cooler controllers	
Power supply	Carrier-grade, 1 million hour MTBF for DC	
Structure	Cast aluminum housing & mount	
Adaptive power control	Adjusts laser power to changing weather conditions	



	SONABEAM 155-E	SONABEAM 52-E
Transmission rates	31 - 180 Mbps (datarate transparent or reclocked)	10 - 68 Mbps (datarate transparent or reclocked)
Transmission standards	E3, DS3, OC-1/STM-0, OC-3/STM-1, Fast Ethernet	E3, DS3, OC-1/STM-0, Ethernet 10baseT
Range: 3 dB/km (clear air)	50 m to 3300 m (160 ft to 2.1 mi)	50 m to 3850 m (160 ft to 2.3 mi)
10 dB/km (extreme rain)	50 m to 1620 m (160 ft to 1.0 mi)	50 m to 1820 m (160 ft to 1.1 mi)
Laser output power	100 mW peak (2 x 50mW)	100 mW peak (2 x 50mW)
Receive aperture	10 cm (4 in) diameter	10 cm (4 in) diameter

MULTI-MODE FIBER-OPTIC INTERFACE CARD

Data physical interface	Multi-mode fiber, SC terminated	Multi-mode fiber, SC terminated
Fiber xmtr output power	-20 dBm (min), -14 dBm (max)	-20 dBm (min), -14 dBm (max)
Fiber rcvr input power	-30 dBm (min), -14 dBm (max)	-30 dBm (min), -14 dBm (max)
3R clock & data recovery (CDR)	User selectable, bypass for rate-transparency or mux	User selectable, bypass for rate-transparency or mux

SINGLE-MODE FIBER-OPTIC INTERFACE CARD

Data physical interface	Single-mode fiber, SC terminated	Single-mode fiber, SC terminated
Fiber xmtr output power	-15 dBm (min), -8 dBm (max)	-15 dBm (min), -8 dBm (max)
Fiber rcvr input power	-31 dBm (min), -8 dBm (max)	-31 dBm (min), -8 dBm (max)
3R clock & data recovery (CDR)	User selectable, bypass for rate-transparency or mux	User selectable, bypass for rate-transparency or mux

FIBER-OPTIC INTERFACE

Interface type	SM or MM fiber, SC terminated
Fiber xmtr wavelength	1310 nm nominal (1280 nm to 1335 nm)
Fiber rcvr wavelength	1310 nm nominal (1280 nm to 1335 nm)

MECHANICAL / ELECTRICAL / ENVIRONMENTAL

Operating temperature	-30°C to 50°C (-22°F to -122°F)
Solar filters	2 spatial, 2 spectral
Pointing stability	120 km/h (75 mph) operating, > 160 km/h (100 mph) survivability
Environmental seal	Water-tight, IP66 + NEMA-4 Certified
Dimensions (W*H*D)	Centimeters: 25 x 33 x 46; Inches: 10 x 13 x 18
Weight - kg (lbs)	Head: 10 kg (22 lbs)
Input voltage	22-57 VDC or 100-200 VAC
Power consumption	Transceiver and heater: 30 watts, max

CARRIER-CLASS RELIABILITY AND DURABILITY

Heating	Window heating prevents optics fogging, snow/sleet accumulation
Laser cooling	Cast aluminum heat sink
Redundant transmitters	2 independent lasers and drivers
Power supply	Telco grade - >550,000 hr demonstrated at 25°C (77°F)
Structure	Cast aluminum and steel housing & mount



ELEMENT MANAGEMENT AND CONTROL

	M / S SERIES	E SERIES
Management interface SNMP	Serial (DB9 or RJ-45) and 10-base-t Embedded v.1 agent	Serial (DB9 or RJ-45) and 10-base-t Embedded v.1 agent
GUI control program	SONAbeam™ Terminal Controller	SONAbeam™ Terminal Controller
Command line interface	Via RS232 or IP address	Via RS232 or IP address
Key parameters monitored	Receive signal strength, Power supply currents and voltages, Laser currents, Laser powers (APC levels), Laser temperatures, Internal temperature and humidity, Clock recovery / sync status, Network interface signal status	Receive signal strength, Laser modu- lation current, 5V internal supply voltage, 5V internal supply current, Internal temperature, Interface card type inserted, Input signal presence, FSO data lock
Historical logging	Internal data and event logging	N/A

CERTIFICATIONS AND CLASSIFICATIONS

	<i>US/Canada</i>	<i>International</i>
Laser safety	CDRH 21 CFR including Laser Notice 50, Class 1M; ANSI Z136.1 & Z136.6, Class 1	IEC 60825-1, Class 1M EN 55022 - emissions
EMC Electrical	FCC - Pat 15 / ICES - 003 UL 60950 / CSA 60950	EN 55024 - immunity EN 60950 (CB scheme)

CORPORATE HEADQUARTERS fSONA Systems Ltd.

1750 Tysons Blvd. Suite 240
McLean, VA 22102 USA
Tel 703 917 4007
Fax 703 917 4009

WEST COAST OFFICE fSONA Systems Corp.

11120 Horseshoe Way, Suite 140
Richmond, BC V7A 5H7 Canada
Tel 604 273 6333
Fax 604 273 6343

INTERNET

Web www.fsona.com
Email info@fsona.com

TOLL-FREE

US/Canada 877 463 7662
International 877 (2) 463 7662



INTERNET

Web www.fsona.com

Email sales@fsona.com

TOLL-FREE

US/Canada 877 463 7662

International 877 (2) 463 7662

SONABEAM™

fSONA's Authorized Reseller: