Time over Fiber
interfacility link systems

1 PPS

CW/SINE STANDARDS

IRIG

GPS

STABLE GROUP DELAY

LOW ALLAN VARIANCE

DUAL REDUNDANT POWER SUPPLIES

FULLY HOT-SWAPPABLE

UP TO SIX LINK MODULES PER 1RU RACK

MULTIPLE BUFFERED OUTPUTS

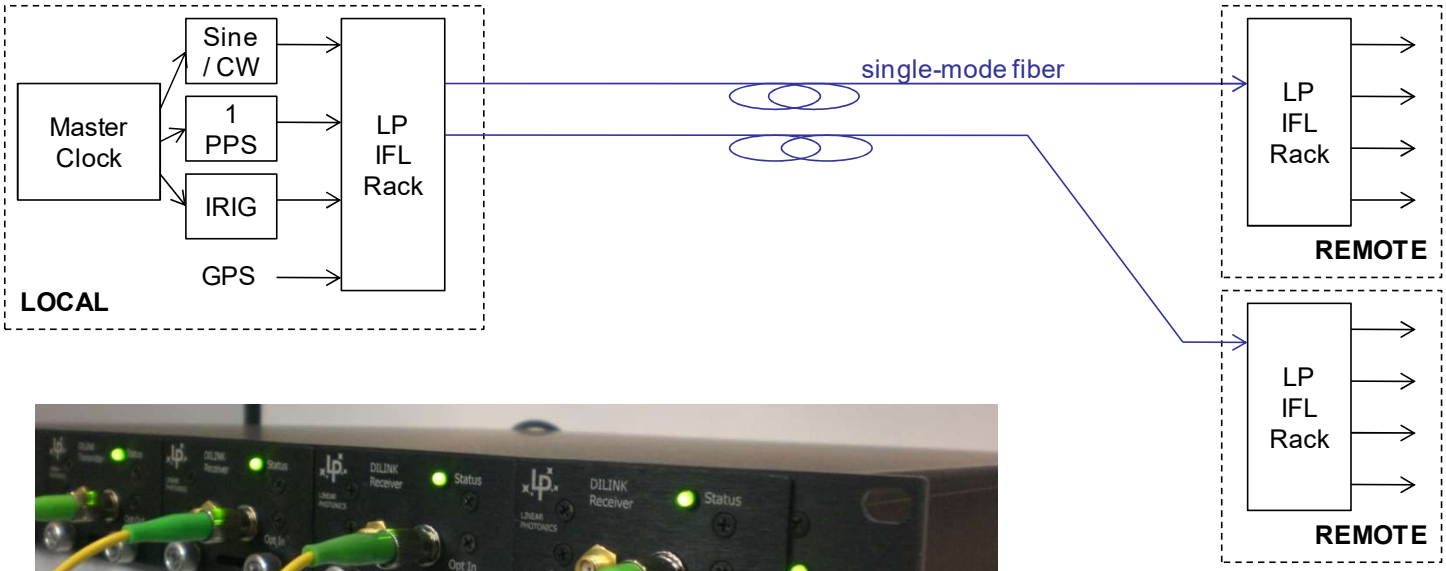
CUSTOMIZABLE IFL PLATFORM

Linear Photonics' Time-over-Fiber (ToF) products provide point-to-point and point-to-multipoint interfacility time standard distribution over single mode fiber.

Single mode fiber offers the advantage of very low loss and stable group delay over very long distances.

At the master site, choose from IRIG, 1 PPS, CW/Sine or GPS input protocols. Fiber Transmitter modules convert the electrical time signal standard to an intensity-modulated laser optical output. Choose from single or multiple fiber outputs for distribution to remote sites.

At the remote site, the Fiber Receiver module converts the optical signal back to the electrical protocol while buffering the signal for directly driving single or multiple time devices.



LINEAR PHOTONICS, LLC ***Bringing Performance to Light!***
3 nami lane, suite 7c | hamilton, nj 08619 | tel. 609 584 5747 | fax. 609 631 0177 | e-mail. macdonald@linphotonics.com

TimeLink

time-over-fiber link modules

> 10 km LINK LENGTH

EMI IMMUNITY

ULTRA-WIDEBAND FREQUENCY RESPONSE

LOW NOISE

HIGH STABILITY

LPL TimeLink products provide precise time distribution over optical fiber. All Optical Transmitters employ low noise Distributed Feedback (DFB) single-mode lasers and single mode optical fiber. All optical receivers employ InGaAs PIN photodiodes. These features combine to provide greater link length and frequency response, lower noise and higher stability than multimode optical or copper-based solutions.

Links accept standard protocol IRIG, 1 PPS, CW/Sine (1-100 MHz) and GPS inputs. Point-to-point and point-to-multipoint options are available.

IRIG Links incorporate Automatic Level Control to provide 0 dB Linear gain independent of link loss.

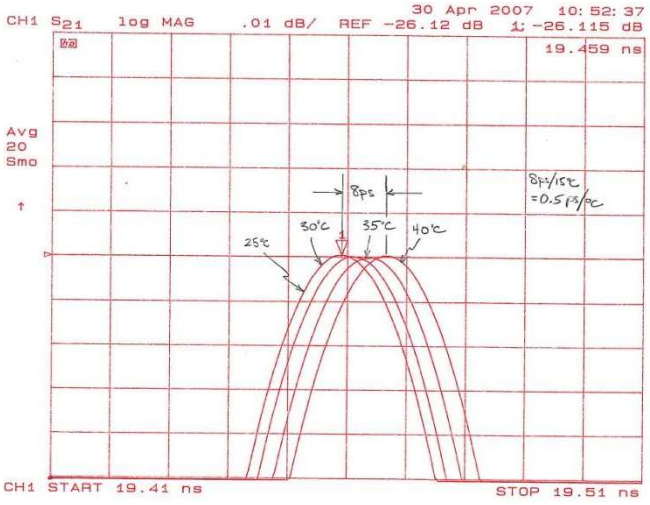
All standard and custom modules are available as hot-swappable Standard LPL IFL Plug-ins.

LINEAR PHOTONICS, LLC ***Bringing Performance to Light!***
3 nami lane, suite 7c | hamilton, nj 08619 | tel. 609 584 5747 | fax. 609 631 0177 | e-mail. macdonald@linphotonics.com

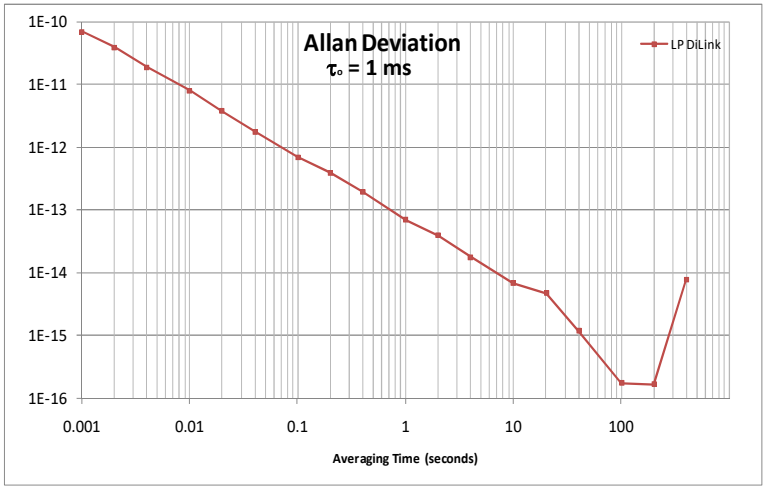
TimeLink LINK PERFORMANCE

Transmitter			
Signal Input	model type:	1 PPS	1 PPS Standard TTL / 50 Ω
		IRIG	IRIG Standard 6 V modulated sine / 50 Ω
		CW/Sine	1-100 MHz / 50 Ω / -50 to +15 dBm (Note 1)
		GPS/L-Band	1000-2000 MHz / 50 Ω / -50 to 0 dBm
Signal Input Connector	SMA or BNC		
Optical Output Connector	Single Mode FC/APC or LC/PC		
Optical Wavelength	1550 nm (standard)		
Number of Outputs		CW/Sine and GPS/L-Band	single output
		1 PPS and IRIG	1, 2 or 4 outputs
Module Size		Single Output	Single-Wide IFL Plug-in
		2 or 4 Outputs	Double-wide IFL Plug-in
Alarm Indictator	GRN: Operational RED: Laser Fault		
Receiver			
Optical Input Connector	Single Mode FC/APC or LC/PC		
Signal Output	model type:	1 PPS	1 PPS Standard TTL / 50 Ω
		IRIG	IRIG Standard 6 V modulated sine / 50 Ω
		CW/Sine	1-100 MHz
		GPS/L-Band	1000-2000 MHz
Signal Output Connector	SMA or BNC		
Number of Outputs		CW/Sine and GPS/L-Band	single output
		1 PPS and IRIG	1, 2 or 4 outputs
Module Size		Single Output	Single-Wide IFL Plug-in
		2 or 4 Outputs	Double-wide IFL Plug-in
Alarm Indicator	GRN: Operational RED: Low/No Optical Input		
End-to-End Link			
Gain		1 PPS	Fixed Output 1 PPS regenerated (< 2 ns rise time)
		IRIG	Fixed Output IRIG Linear Transfer with ALC
		CW/Sine and GPS/L-Band	Linear Transfer 0 dB Gain with 1 km fiber
Group Delay Variation	+500 fs/°C typical		
Environmental			
Operating Temp Range	0 to 50°C		
Link Length	0 to 10 km		

Note 1: Phase noise performance of the CW/Sine Link is best with transmitter input power close to +15 dBm.



Pulsed Group Delay vs Temperature
HF CW/Sine Link Modules



System Allan Variance
HF CW/Sine Link Modules

LINEAR PHOTONICS, LLC ***Bringing Performance to Light!***
3 nami lane, suite 7c | hamilton, nj 08619 | tel. 609 584 5747 | fax. 609 631 0177 | e-mail. macdonald@linphotonics.com

TimeLink PART NUMBER INFORMATION

Custom options are available. Call LPL.

T	L	m	p	n	r	o

example:
TLTP2SL
Transmitter
1 PPS Protocol
Dual Optical Outputs
SMA RF Input
LC/PC Optical Outputs

* Multiple outputs are only availble on 1 PPS and IRIG models

m Module Type
- T Transmitter
- R Receiver

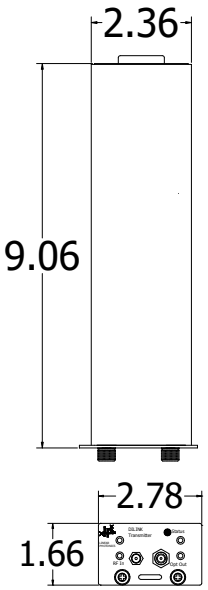
p Protocol
- P 1 PPS
- R IRIG
- H HF, 1-100 MHz
- L GPS/L-Band, 1000-2000 MHz

n Number of Outputs
- 1 Single Output, Single-wide
- 2 Dual Output, Double-wide *
- 4 Quad Output, Double-wide *

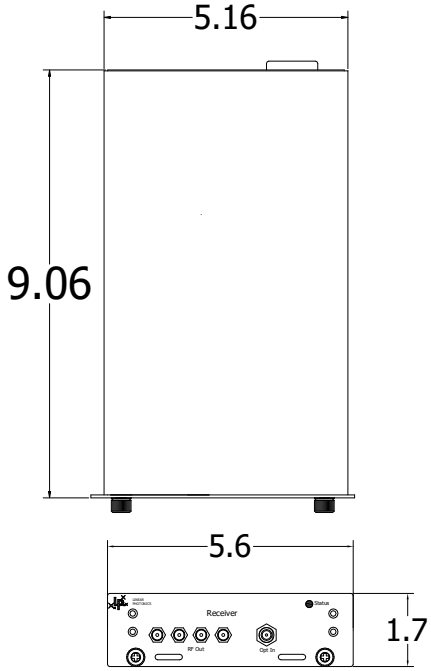
r RF Connector(s)
- S SMA
- B BNC

o Optical Connector(s)
- F FC/APC
- L LC/PC
- A LC/APC

TimeLink SINGLE-WIDE PLUG-IN



TimeLink DOUBLE-WIDE PLUG-IN



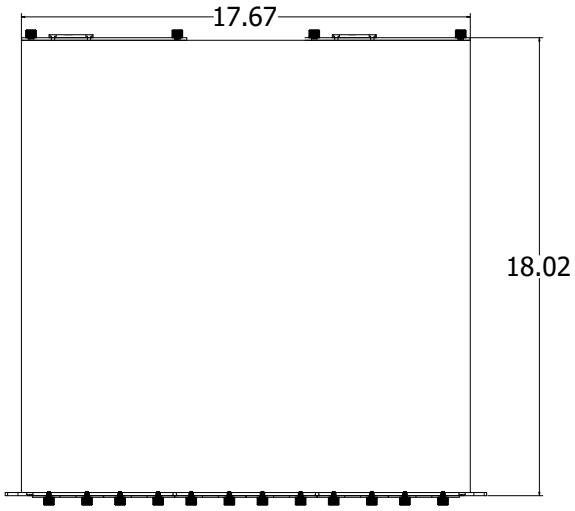
LINEAR PHOTONICS, LLC ***Bringing Performance to Light!***
3 nami lane, suite 7c | hamilton, nj 08619 | tel. 609 584 5747 | fax. 609 631 0177 | e-mail. macdonald@linphotonics.com

IFL-RACK
system platform

DUAL REDUNDANT POWER SUPPLIES

FULLY HOT-SWAPPABLE

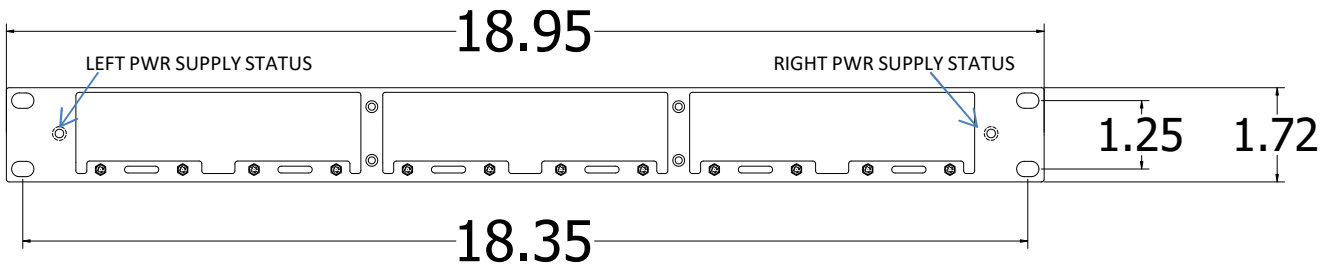
UP TO SIX SINGLE-WIDE MODULES IN 1RU



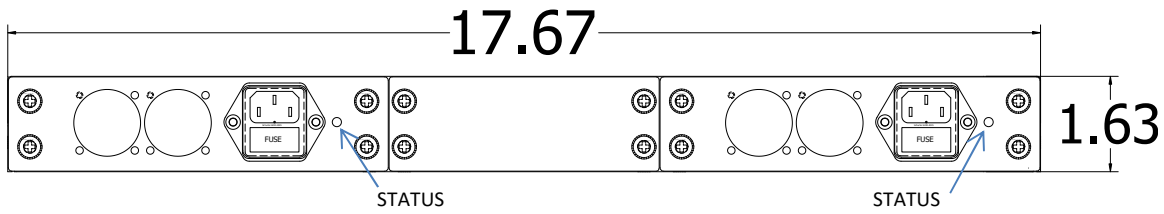
IFL RACK CHASSIS SPECIFICATION

AC Input	95 - 260 V 50/60 Hz 2 A fused
Dimensions w x l x h inch(cm)	18.9 x 18.75 x 1.7 (7.5 x 7.4 x 1.7)
Front Panel Indicators	Right/Left Power Supply LEDs
Empty Weight	12 lbs including dual power supplies
Capacity	6 single-wide slots

IFL RACK FRONT



IFL RACK REAR WITH POWER SUPPLIES



LINEAR PHOTONICS, LLC ***Bringing Performance to Light!***
3 nami lane, suite 7c | hamilton, nj 08619 | tel. 609 584 5747 | fax. 609 631 0177 | e-mail. macdonald@linphotonics.com

IFL-PS

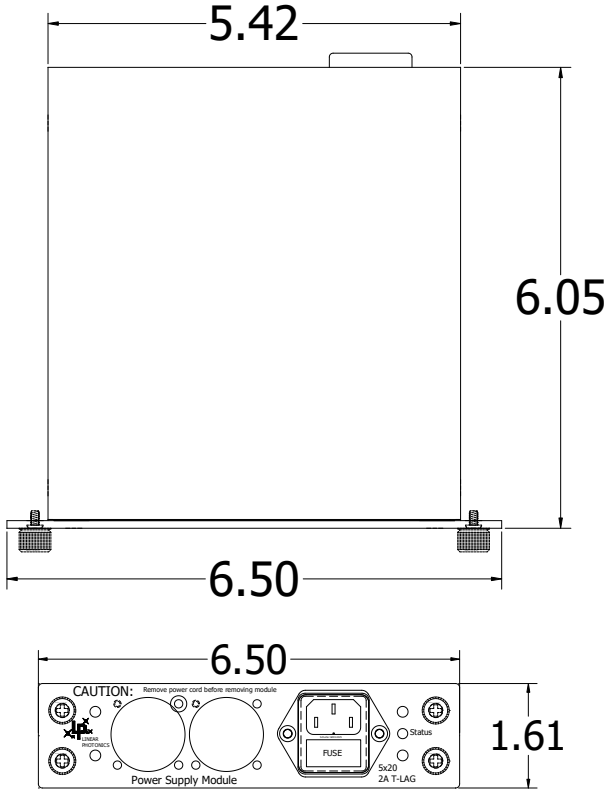
IFL power supply

IFL Power Supplies provide prime power for all IFL Rack equipment and plug-in modules.

Each Power Supply is designed to provide power for full capacity to the rack. Two supplies can be installed, providing automatic redundant backup in case of failure.

IFL-PS SPECIFICATION

AC Input	95 - 260 V 50/60 Hz 2 A fused
AC Line Fuse	5x20 mm 2A T-LAG
STATUS LED	Dual Color (RED=ALARM, GREEN=OK)
Power	50 Watts at full rack capacity



LINEAR PHOTONICS, LLC ***Bringing Performance to Light!***
3 nami lane, suite 7c | hamilton, nj 08619 | tel. 609 584 5747 | fax. 609 631 0177 | e-mail. macdonald@linphotonics.com