RX IR/Green/UV Series Picosecond Lasers

High Power ps Lasers

With patented pulse selection and a thousand picosecond lasers shipped worldwide, the RX Series lasers, with its new revolutionary packaging has smaller form factor and higher performance compared to its ancestor, the RGH series providing from 10W to 100W of IR, 5W to 70W of Green and 3W to 45W of UV output powers on the simplest, most compact AIO (All-in-One) platform from single shot to 2MHz (optional to 8MHz).

Proprietary technologies enable the RX Series lasers to provide twice as much pulse energy as comparable competitors' systems. Such high pulse energies allow for process efficiency optimization by spatial scaling, since the beam can be split numerous times to simultaneously feed multiple work stations yielding the lowest Cost of Ownership (COO).

The user-friendly control interface allows **Total Pulse Control** and **Burst Mode** operation, where a user selectable number of 10 ps pulses with 14 ns separation can be released in an envelope, further enabling ablation rate increases on many materials. With adjustable repetition rate from single shot to 8MHz, the user can change the operating PRF and change the operating power or pulse energy through **PEC** (Power or Pulse Energy Control) function on the fly to maximize process flexibility.

Photonics Industries picosecond lasers have proven their robustness for even the most demanding industrial manufacturing environments for applications ranging from metal engraving/marking, LED dicing, thin film removal, small feature structuring, glass, sapphire and ceramics cutting, drilling, etc. to 3D LIDAR.

Photonics Industries
International, Inc.

PI Advantages

- **The Highest Pulse Energy ps laser in the market ~1mJ in IR, over 400uJ in Green and ~200uJ in UV**
- **High Power (to 100W in IR) short pulse (~10ps) laser**
- **The most compact rugged All-in-One ps laser**
- **The highest efficiency ps laser with the lowest power consumption < 600 W typical**
- **High repetition rates up to 8MHz**
- **Excellent TEM_{00} beam with typical $M^2 \leq 1.3$**
- **Exceptional Beam Pointing Stability < 20 µrad**
- **PEC (Power or Pulse Energy Control) and Burst Mode capability**

Applications

- **Cutting and scribing of display glass and functional foils for FPDs**
- **Glass and sapphire cutting and drilling**
- **Semiconductor scribing and dicing**
- **PCB processing**
- **Ceramic cutting, drilling and scribing**
- **Solar cell scribing and drilling**
- **LED scribing, dicing and patterning**
- **Metal cutting, drilling and marking**
- **Medical device cutting, drilling and marking**
- **Laser Cutting for Glass Reinforced Plastic & Carbon Fiber**
- **Ink-Jet Nozzle Drilling**
- **Printing & Embossing Tools**

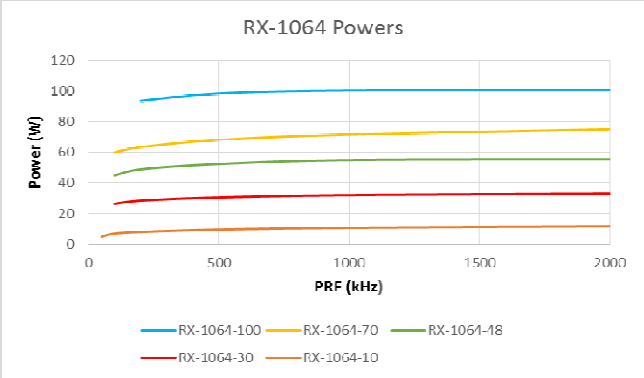
System Specifications @ 1064nm

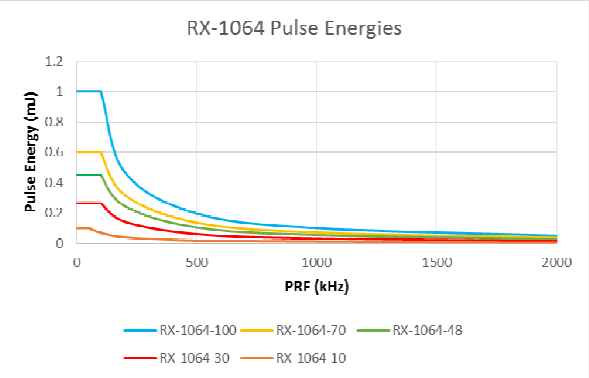
Model	RX-1064-10	RX-1064-30	RX-1064-48	RX-1064-70	RX-1064-100
Output Characteristics					
Average Power	10W @ 1 MHz	30W @ 1 MHz	48W @ 1 MHz	70W @ 1 MHz	100W @ 1 MHz
Max Pulse Energy	100µJ@50kHz	250µJ@100kHz	420µJ@100kHz	up to 600µJ	~ 1mJ**
Pulse Width	~10 ps				
Repetition Rate†	Single Shot to 2 MHz (Option to 8MHz)				
Pulse to Pulse Stability @ 1MHz	~1% rms				~2% rms
Long Term Power Stability (8h ±3°C)	≤ 1% rms				
Beam Characteristics					
Spatial Mode	TEM_{00} $M^2 \leq 1.3$				
4σ Beam Diameter @ exit (nominal)	~1.5mm	~2mm			
Beam Pointing Stability	< 20 µrad				
Operating Specifications					
Interface	Ethernet / RS 232 / GUI / External TTL Triggering				
Warm Up Time	< 15 min				
Electrical Requirement	100 to 240V AC				
Line Frequency	50 to 60 Hz				
Relative Humidity	Non-condensing, 90% Max				
Power Consumption (excluding chiller)	< 600 W				
Ambient Temperature	15°C to 30°C (59° to 86°F) Operating Range				
Physical Characteristics					
Dimensions (W x H x L)	10 in x 3.75 in x 24 in	12 in x 3.75 in x 26 in		12 in x 3.75 in x 29.12 in	
Weight	~58lbs	~74lbs		~90lbs	
Vibration	Up to 3g				
Cooling	Closed Loop Chiller				

† Lower rep rates (down to single shot) achieved by selecting higher rep rate pulses with the AOM.

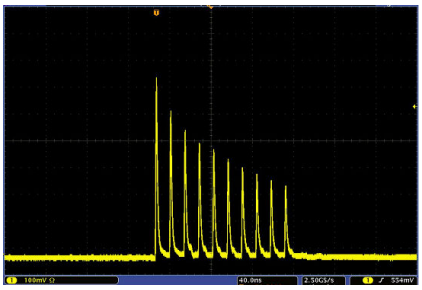
** In burst mode

Performance Curves

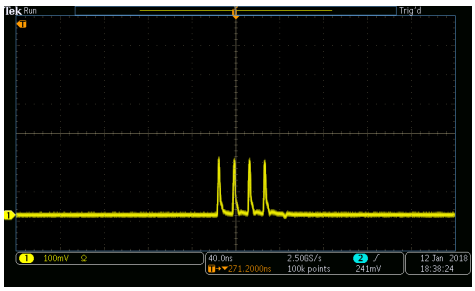




Burst Mode



Flat Burst Mode



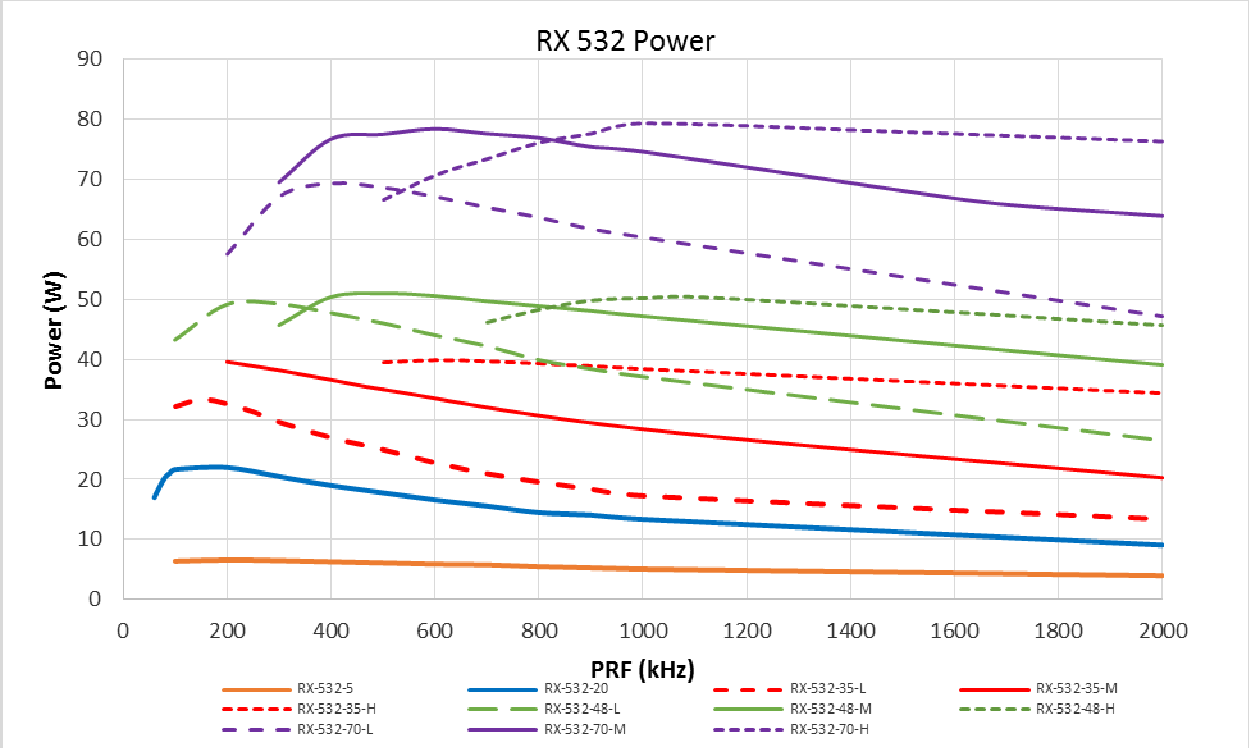
Burst mode pulses are ~14ns apart

System Specifications @ 532nm

Model	RX-532-5	RX-532-20	RX-532-35	RX-532-48	RX-532-70
Output Characteristics					
Average Power	5W@100 kHz	20W@100 kHz			
-L			30W@200 kHz	48W@200 kHz	70W@400 kHz
-M			35W@200 kHz	48W@400 kHz	70W@600 kHz
-H			35W@800 kHz	48W@1 MHz	70W@1 MHz
Pulse Width			~7ps		
Repetition Rate†			Single Shot to 2 MHz (Option to 8MHz)		
Pulse to Pulse Stability @ 1MHz			< 2% rms		
Long Term Power Stability (8h ±3°C)			≤ 1% rms		
Beam Characteristics					
Spatial Mode			TEM_{00} $M^2 \leq 1.3$		
4σ Beam Diameter @ exit (nominal)	~1mm		~1.5mm		
Beam Pointing Stability			< 20 urad		
Operating Specifications					
Interface			Ethernet / RS 232 / GUI / External TTL Triggering		
Warm Up Time			< 15 min		
Electrical Requirement			100 to 240V AC		
Line Frequency			50 to 60 Hz		
Relative Humidity			Non-condensing, 90% Max		
Power Consumption (excluding chiller)			< 600 W		
Ambient Temperature			15°C to 30°C (59° to 86°F) Operating Range		
Physical Characteristics					
Dimensions (W x H x L)	10 in x 3.75 in x 24 in		12 in x 3.75 in x 26 in		12 in x 3.75 in x 29.12 in
Weight	~58lbs		~74lbs		~90lbs
Vibration			Up to 3g		
Cooling			Closed Loop Chiller		

† Lower rep rates (down to single shot) achieved by selecting higher rep rate pulses with the AOM.

Performance Curves



System Specifications @ 355nm

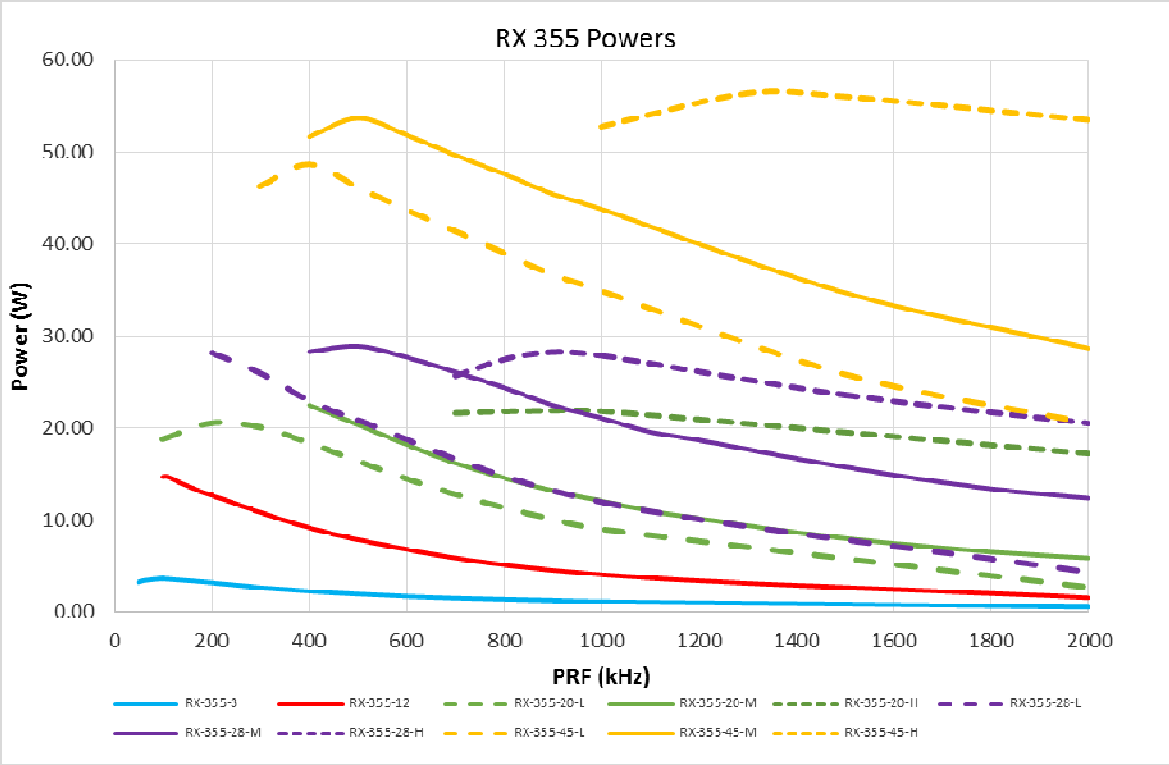
Model	RX-355-3	RX-355-12	RX-355-20	RX-355-28	RX-355-45
Output Characteristics					
Average Power	3W@100kHz	12W@100kHz			
-L			20W@200 kHz	28W@200 kHz	45W@400 kHz
-M			20W@400 kHz	28W@400 kHz	45W@600 kHz
-H			20W@1 MHz	28W@1 MHz	45W@1 MHz
Pulse Width			~7ps‡		
Repetition Rate†			Single Shot to 2 MHz (Option to 8MHz)		
Pulse to Pulse Stability @ 1MHz			< 3% rms		
Long Term Power Stability (8h ±3°C)			≤ 1% rms		
Beam Characteristics					
Spatial Mode			TEM_{00} $M^2 \leq 1.3$		
4σ Beam Diameter** @ exit (nominal)			~1mm		
Beam Pointing Stability			< 20 urad		
Operating Specifications					
Interface			Ethernet / RS 232 / GUI / External TTL Triggering		
Warm Up Time			< 15 min		
Electrical Requirement			100 to 240V AC		
Line Frequency			50 to 60 Hz		
Relative Humidity			Non-condensing, 90% Max		
Power Consumption (excluding chiller)			< 600 W		
Ambient Temperature			15°C to 30°C (59° to 86°F) Operating Range		
Physical Characteristics					
Dimensions (W x H x L)	10 in x 3.75 in x 24 in	12 in x 3.75 in x 26 in		12 in x 3.75 in x 29.12 in	
Weight	~58lbs	~74lbs		~90lbs	
Vibration			Up to 3g		
Cooling			Closed Loop Chiller		

† Lower rep rates (down to single shot) achieved by selecting higher rep rate pulses with the AOM.

‡ derived from IR and green

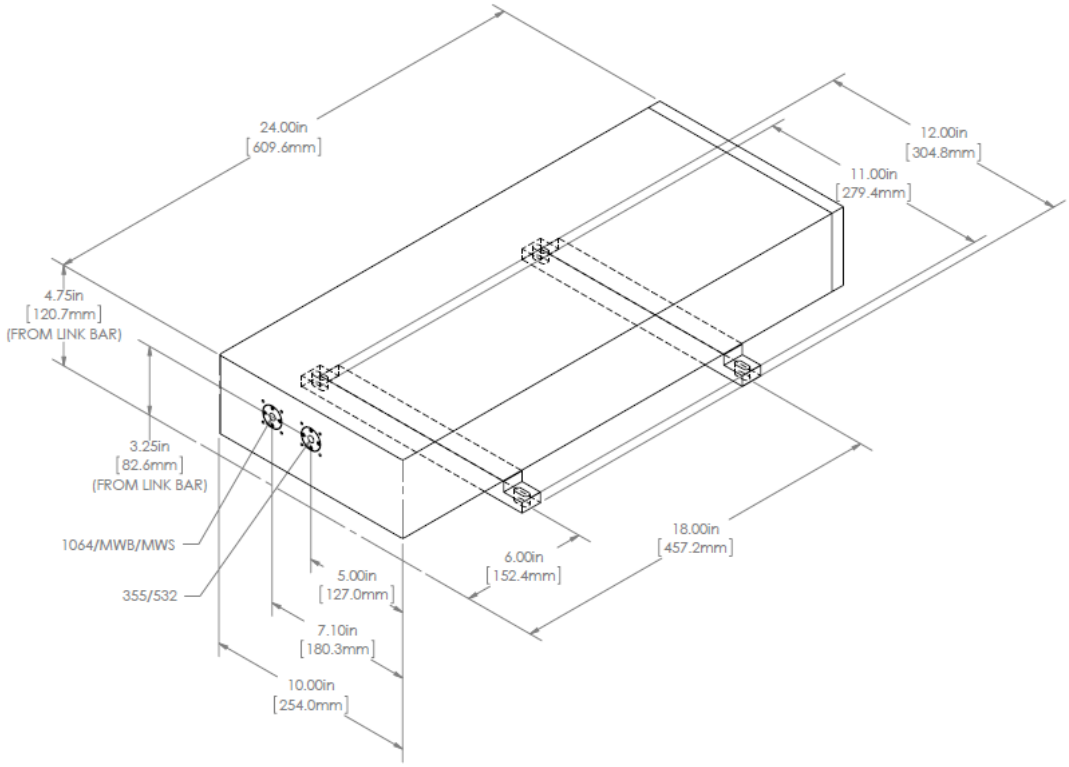
** Larger beam diameters (up to ~5mm) available with expansion option

Performance Curves

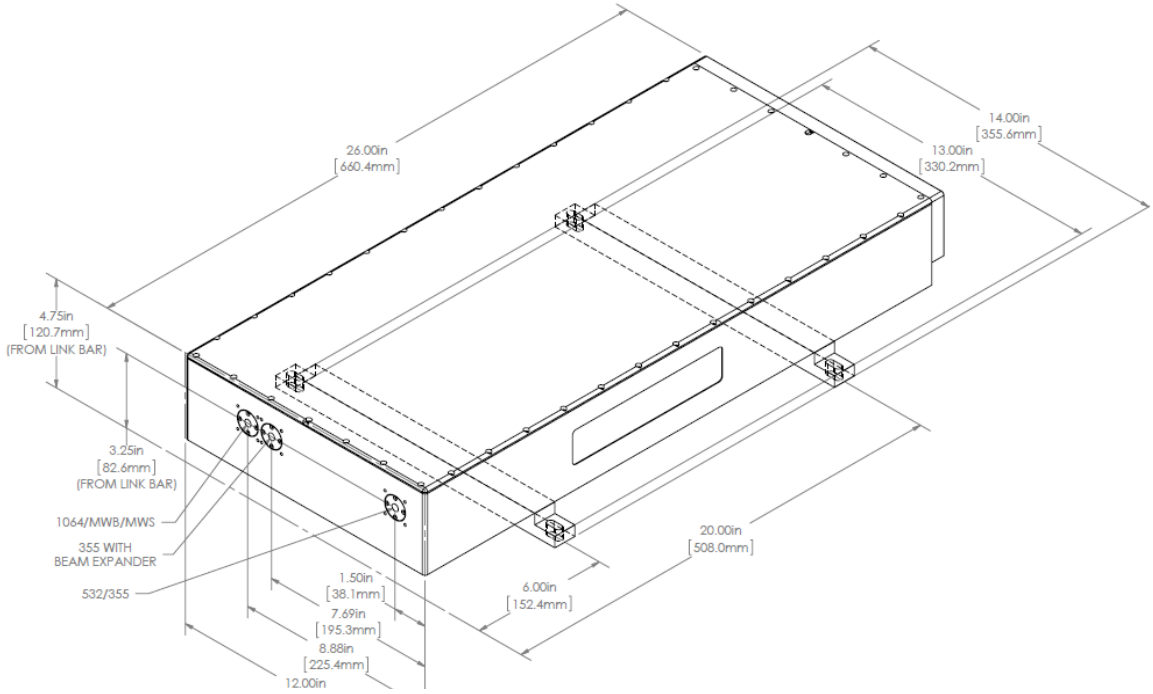


Dimensional Drawings

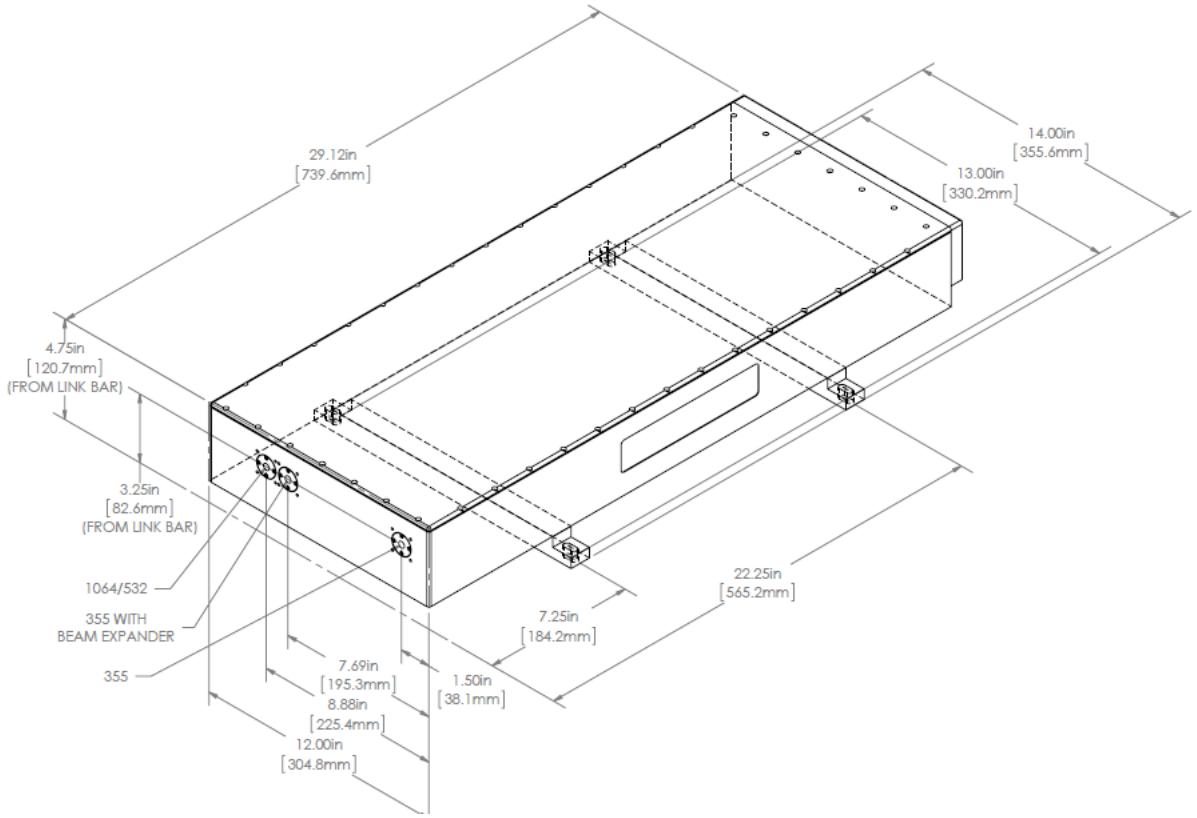
RX-1064-10, 532-5 & 355-3 Laser



RX-1064-30 & -48, 532-20 & -35 and 355-12 & -20 Laser



RX-1064-48, -70 & -100, 532-30, -48 & -70 and 355-20, -28 & -45 Laser



1800 Ocean Ave. Ronkonkoma, NY USA 11779 Phone: 631-218-2240 Fax: 631-218-2275
E-Mail: info@photonix.com Website: www.photonix.com