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# Options of Photonics DP2-447 Laser Service

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**Caltech**

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# Summary of DP2 Status



The DP2 laser was commissioned at P5 in March, 2012. It has been working 24/7 for about six months. While there were damaged optics in down-stream optics the laser itself has been OK until recently when three steps were observed on August 25, 31 and September 2 showing decreases of the DP2 pulse energy and FWHM and increases of the laser timing. These degradations were suspected to be caused by the laser itself, which is confirmed by the laser power measurement by David on September 3 as well as the diagnostics by Liyuan and David this week. After discussing with Photonics experts it is concluded that the DP2-447 laser needs service, which is covered by manufacture's warranty.



# First Option



Continue using DP2 with reduced pumping current, e.g. 45 A, and software-feedback which is expected to stabilize the laser, as long as the laser is alive or until the pp run ends. In any case the laser should be serviced before the warranty expires.

**Pro:** possibility that DP2 may be available for the entire 2012 data taking.

**Con:** Increased laser pulse width, e.g. 25 ns instead of 20 ns, and a compromised stability.



# Second Option



Send it back to Photonics for a warranty service. The standard turn-around time is six to eight weeks, which may be reduced to one week with an emergency expedite fee of \$2.5k (Quotation I).

Pro: DP2 will be fixed in a short time.

Con: Up to two weeks without DP2 at CERN



# Photonics Quotation (I)



## Photonics Industries

390 Central Ave., Bohemia, NY 11716, USA  
Tel: 631-218-2240 Fax: 631-218-2275  
www.photonix.com info@photonix.com

International, Inc.

Quotation Number: RQ12-0917AB2  
Model, Serial Number: DP2-447  
RMA Number:  
Date Received:  
Current Date: 9/17/12  
Valid Until: 10/17/12  
Payment: Net 30  
Freight: F.O.B. Bohemia, NY

*REPAIR QUOTATION*

<b>To:</b> CERN		<b>From:</b> Photonics Industries 390 Central Avenue Bohemia, NY 11716	
<b>Tel:</b>		<b>Tel:</b> 631-218-2240	
<b>Fax:</b>		<b>Fax:</b> 631-218-2275	
<b>Attn:</b> Liyuan Zhang		<b>Attn:</b> Alexandra Bello	
<b>Part(s) Description</b>	<b>List Price</b>	<b>Qty</b>	<b>Ext. Price</b>
Emergency Expedite Evaluation Fee	\$2,500.00	1	\$2,500.00
	<b>Total</b>		<b>\$2,500.00</b>



# Third Option

Photonics sends an engineer to CERN. We will have to pay the travel expenses (\$5k) according to the warranty. Since we already have all spare parts this option may provide the shortest time to have this laser fixed.

**Pro: The shortest time without DP2 at CERN.**

**Con: It is unclear if the engineer has the capability and equipment to fix DP2 at CERN.**



# Photonics Quotation (II)



## Photonics Industries

390 Central Ave., Bohemia, NY 11716, USA **International, Inc.**  
Tel: 631-218-2240 Fax: 631-218-2275  
www.photonix.com info@photonix.com

Quotation Number: RQ12-0917AB-Addendum A *REPAIR QUOTATION*  
Model, Serial Number: DP2-447  
RMA Number:  
Date Received:  
Current Date: 9/18/12  
Valid Until: 10/17/12  
Payment: Net 30  
Freight: F.O.B. Bohemia, NY

To: CERN	From: Photonics Industries 390 Central Avenue Bohemia, NY 11716
Tel:	Tel: 631-218-2240
Fax:	Fax: 631-218-2275
Attn: Liyuan Zhang	Attn: Alexandra Bello

Part(s) Description	List Price	Qty	Ext. Price
Airfare (estimated)	\$2,000.00	1	\$2,000.00
Hotel (3 nights)	\$500.00/night	3	\$1,500.00
Rental car (4 days)	\$375.00/day	4	\$1,500.00
Meals (5 days)	\$50.00/day	5	\$250.00
This is the estimate for on site labor and related travel and living expenses for Photonics Industries to diagnose and evaluate your laser on site. It does not include parts nor does it guarantee that we can fix your laser on site.			
<b>Total:</b>			<b>\$5,250.00</b>



# Fourth Option



We do service at CERN by ourselves, and with Photonics engineer on call. Unfortunately, we are not yet trained for work on the laser cavity. In addition, this would violate the Photonics warranty so needs is not practical at this point. In the long term we may choose this option, however.





# DP2-447 Warranty & Spare Parts




**Photronics Industries**  
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## Field Replaceable Spare Parts and Warranty Options for DP2-447 Laser System

Part #	description	Price	Quantity	Lifetime
5027842	Diodes	\$6,600.00	2	guaranteed for 5,000hours
8227500	Output Window	\$550.00	1	3-5 Yrs
2026715	Laser Diode Driver	\$3,750.00	1	5 Yrs +
2026244, 2026257, 2027899, 2027074	Power Supplies	\$1,000.00	4	5 Yrs +
8027164	Dawn Board	\$300.00	1	3-5 Yrs

### Extended Warranty Options for DP2-447 Laser System:

#### Service Plan I

Service Plan I is available to cover Photronics Industries laser systems. This plan provides coverage for a service engineer or a laser system to allow for rapid replacement of a laser requiring service. Under this plan, Photronics Industries will either send an engineer to the customer site to repair the laser or if it is deemed that the laser can not be repaired in the field will send a replacement laser to the customer within 24 hours of notification. If a replacement laser is sent then the laser to be serviced will be returned to Photronics Industries or a Photronics Industries designated service center at the discretion of Photronics Industries. The laser will be serviced to conform and meet original specifications. The customer may choose to keep the replacement laser or have the original laser returned to them.

This agreement may be purchased at any time provided the system is still under original warrantee or currently covered under Service Plan I

The advantage of this plan is that the customer does not have to purchase and maintain a spare laser. For this service, a yearly fee of 30% of the laser price will be charged.

#### Service Plan II

Service Plan II is an extension of the standard warrantee. Under this plan a laser that requires service is to be returned to Photronics Industries or a Photronics Industries designated service center at the discretion of Photronics Industries. The laser will be serviced and returned to the customer. During the time the laser is being serviced, a laser will be lent to the customer, if available. Upon return of the serviced laser, the customer must return the loaner laser to Photronics Industries within one (1) week. If the laser has to be returned to Photronics Industries, the customer will be responsible for all the shipping charges, taxes and duties related to shipping the lasers Photronics Industries.

This agreement may be purchased at any time provided the system is under original warrantee or currently covered under Service Plan II.

For this service Photronics will charge a yearly fee of 20% of the laser price will be charged.

#### Service Plan III

Service Plan III is available to cover Photronics Industries laser systems. Lasers in need of repair should be returned to Photronics Industries for evaluation. Upon evaluation Photronics Industries will give the customer a detailed quotation for the required repair. If the customer accepts this quotation, Photronics will make the repairs and return the laser to the customer. The customer will be responsible for all the repair charges, shipping charges, taxes and duties related to shipping the lasers to and from Photronics Industries.

**Plan 1: Photronics sends a replacement 30% of laser cost, or \$51k/year.**

**Plan 2: Photronics sends a loaner if available, which is required to be sent back within a week after service. 20% of laser cost/year, or \$34k/year.**

**Plan 3: Laser returned to Photronics Pay service fee each time. Service time needed is 6 to 8 weeks.**

**User self-service is not recommended.**