



翻訳サービス(英・日)

レーザー・コンシェルジェ株式会社

- **スペシャリスト**  
レーザーや光学系の有識者が翻訳しておりますのでおかしな訳が無く校正作業もスムーズで最小限
- **リーズナブル**  
外注などの下請けを使っていないのでコストは最小限
- **スピーディー**  
社内ですべての作業を行っているので緊急の対応も可能
- **幅広い対応**  
マニュアルやパンフレットはもちろんweb等の翻訳も対応
- **少数も可能**  
1枚からの翻訳も行いますのでちょっとした資料にも利用可能
- **わかりやすい**  
ページ単価なので見積がわかりやすい



## 3.6 Q-SWITCH TIMING AND CONTROL

The Q-switch in the laser head serves as an optical switch that determines the energy build up in the laser gain medium. This allows control of individual laser pulse energies. Additionally, the timing and level of the RF to the Q-switch allows First Pulse Suppression, Pulse Equalization, Dynamic Pulse Control, and CW power level control:

### 1. First Pulse Suppression (FPS)

During externally triggered, high repetition rate burst-mode operation, the first pulse in a pulse train could have significantly more energy than subsequent pulses due to the long energy build-up time. With FPS on, as in most Q-series models, if no trigger signal occurs within a certain time, ramping down the RF to dissipate the build-up of energy prevents potentially large first pulses. This time is determined as  $1/Fpe$ , where  $Fpe$  is the Frequency of Pulse Equalization.  $Fpe$  for most models is a preset parameter as required for safe laser operation. As illustrated in Figure 3.4, the first pulse is eliminated and subsequent pulses are of equal energy.

### 2. Pulse Equalization

In Internal mode of operation, the time of energy build-up as controlled by the Q-Switch is limited in order to avoid optics damage due to excessive pulse energies. At frequencies below  $Fpe$ , the time that the Q-switch is on is limited to  $1/Fpe$ . As a result, the energy per pulse is kept constant.

### 3. Dynamic pulse control (DPC)

In External trigger mode, the RF window is controlled in part by the external trigger signal. In operation, the laser is triggered by the active edge (normally high to low) of the trigger signal. The RF is kept off as long as the trigger signal is true. However, internal timing in the power supply insures that the RF window will not be shorter than the minimum window as determined by the laser head model type (minimum RF window – see Appendix 1).

When the trigger signal goes false (normally high), the RF turns back on causing the laser to accumulate energy. The longer the RF is on, the larger the next pulse will be. This feature allows the user to control the energy of each pulse. To protect the laser optics, the maximum time the RF is allowed to be on is given by  $1/Fpe$ . If  $1/Fpe$  is exceeded, the RF is ramped down and triggering is locked out for 200-usec.

Dynamic Pulse Control is enabled by putting the back panel CW Default switch in the up position.

### 4. CW power control.

With the CW default switch down, RF is completely off in the CW operational mode. With the CW default switch up, the RF level control allows control over the CW power level (see Section 3.9).

Figure 3.4 illustrates FPS operation with a short trigger pulse or with CW default enabled. After suppressing a pulse, the RF will turn back on and the laser will be ready to produce a pulse at the repetition rate of the pulse train.

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左図はワード数488です

レーザー・コンシェルジエ ¥4,000-

A4 サイズ = ¥4,000-

他の翻訳会社 ¥9,760-

¥20(1ワード単価) × 488ワード

価格差は歴然

# 比較(表が入ったとき)

Laser Concierge, Inc.

Table 9: Main Circuit Board LED Functions

| Name     | Function   |
|----------|--|
| CHILL_EN | Indicates chiller is enabled   |
| LDIODE   | Indicates voltage on laser diodes is greater than 5 volts.                                   |
| DIO_PS   | Is on when diode power supply is enabled.  |
| PWR      | Turned on by power supply +5V.   |
| LASE_EN  | Indicates laser diodes are logically enabled.  |
| OVR_CUR  | On if an over current fault on laser diodes has been detected. Cleared by going to STANDBY.  |
| OVR_V    | Indicates over voltage fault on laser diodes has been detected. Cleared by going to STANDBY. |
| OVR_TMP  | On if head over temperature condition detected. Cleared by going to STANDBY.                 |
| VALVE    | On if refrigerant valve closed   |

In Standby, CHILL\_EN, DIO\_PS and PWR should be on continuously. After coming out of Standby, LASE\_EN should also turn on continuously and VALVE should turn on every 32 seconds following the chiller cycle (the longer the on-time, the more the chiller is cooling). LDIODE may or may not turn on depending on the laser head model and the selected diode current DT.

**System analysis using RF Wattmeter:** In the event that symptoms indicate a problem with the Q-switch or RF drive, measurement of the RF power provides useful information. Lightwave uses a directional Wattmeter (Bird Model 43), which includes a plug-in that is rated at 10W and covers a frequency range that includes 41MHz (more information at [www.bird-electronics.com](http://www.bird-electronics.com)). The Wattmeter allows measurement of the RF power directed to the laser head and RF power reflected from the laser head.

**CAUTION:** Put the power supply in STANDBY or turn it off when connecting and disconnecting RF cables. Operation with improperly terminated cables may result in damage and may void the warranty.

The original RF powers were measured in the Internal Mode at the factory and the values are recorded on the data sheet that was provided with the laser system. Make sure to set the pulse repetition rate to the same value recorded in the laser data sheet. Note, that RF power meters are often not well calibrated and results might vary by as much as 10% from meter to meter. Reflected RF power of more than 1 Watt indicates a problem with the Q-switch or an open, loose or broken connector.

Please include a summary of any of the above analyses you performed with your failure report. Lightwave or your local Lightwave representative will review the information provided and will recommend further action. The more information is provided, the easier it is to find the root cause of the problem, solve the problem and implement long-term corrective action.

ページ単価の場合、表が入ると割高に感じますが実際そんなことはありません。

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表を入れるとさらに価格差が広がる

# 比較(行数が少ないとき)

Laser Concierge, Inc.

**WARNING:** Although the shutter is intended as a safety feature, never rely solely on the shutter's operation for safety. Always wear eye protection when using the laser, even with the shutter closed.

## Safety Interlock

The user may disable the laser for safety purposes using the safety interlock provided. The interlock is described in more detail in Section 2.4.

ページの終わりは数行のページがあったりしますが、こんな時でもお得です

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|              |     |
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| レーザー・コンシェルジェ | ¥0- |
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5行(表題を除く)まで無料

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# 全体比較

Laser Concierge, Inc.

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