# PX-2 Pulsed Xenon Lamp

The **PX-2 PULSED XENON LAMP** is a high flash rate, short-arc xenon lamp for applications involving absorbance, reflection, fluorescence and phosphorescence measurements. The PX-2 operates at speeds up to 220 Hz and offers critical pulse-to-pulse stability.

## Parts Included

- PX-2 Pulsed Xenon Lamp
- 15-pin cable for connecting the PX-2 to the spectrometer
- 12V DC wall transformer for supplying power to the PX-2

## Caution!

- The beam emerging from the PX-2 produces ultraviolet radiation. Direct contact with the beam could cause eye injury. Never look directly into the light source.
- Dangerous voltages present. Never operate the PX-2 without its housing intact.
- The SMA connector may get **HOT** during operation.
- This instrument should not be used for any clinical or diagnostic purposes.
- Handle with care. Dropping the instrument may cause permanent damage.

## Operation

The lamp is triggered with TTL pulses delivered through the 15-pin connector located at the rear of the unit. Our S2000-series spectrometers and software, or any source of TTL signals, supplies these pulses. The lamp is powered by a 12V DC transformer, or from a 12V battery if field use is desired.

1. Plug the wall transformer into a 110V outlet. Plug the other end of the cord into the jack at the rear of the PX-2.
2. Install the 15-pin cable into the rear of the PX-2. Connect the other end to the 15-pin connector on an S2000.
3. Connect an optical fiber to the SMA-terminated fiber optic port on the front panel.
4. Turn the power switch located at the rear of the source to the “ON” position.
5. Select either “MULTIPLE” or “SINGLE” flash mode by moving the toggle on the rear of the source.
6. Configure OOIBase32 operating software to operate the PX-2. In the **Acquisition Parameters** dialog bar, check the **S2000 Strobe Enable** box. You can also enable this function by selecting **Spectrum | Configure Data Acquisition** from the menu and then choosing the **Strobe** page of the dialog box.
7. The flash should fire with a clearly audible “ping.”

## Application Tips

### Single Flash Mode

Using the Single flash mode results in one flash per integration cycle. Since the PX-2 has a maximum repetition rate of 220 Hz, the minimum integration allowed in this mode is 5 milliseconds.

### Multiple Flash Mode

When using the Multiple flash mode the user needs to ensure that a constant number of flashes occurs for every integration cycle by setting the pulse rate and integration time. This achieves a continuous and stable signal. The pulse rate is determined by a jumper setting inside the S2000 (JP3). The integration time is controlled via the

operating software. To achieve a constant number of flashes per integration cycle, the integration time must be a multiple of those shown in the following table:

| S2000 JP3 setting | For DAQ700, Integration time must be a multiple of | For ADC500 and SAD500, Integration time must be a multiple of | For ADC1000, Integration time must be a multiple of |
|---|---|---|---|
| $2^{16}$ (default) | 512 | 128 | 64 |
| $2^{14}$ | 128 | 32 | 16 |
| $2^{12}$ | 32 | 8 | 4 |
| $2^{10}$ | 8 (with a minimum value of 24 ms) | N/A | N/A |

The pulses per second of the PX-2 (or the repetition rate) is controlled via Jumper Block (JP3) on the circuit board of the S2000. It is also dependent upon the frequency of your A/D card. The table below shows the rep rate for the various combinations of hardware and jumper settings. (Note that the default setting from the factory is $2^{16}$.)

| JP3 Post # | Function | ADC500, SAD500 | ADC1000 | DAQ700 |
|---|---|---|---|---|
| 1 | Not enabled | Not enabled | Not enabled | Not enabled |
| 2 | Divide by $2^{10}$ | Too fast | Too fast | 98.0 |
| 3 | Divide by $2^{12}$ | 122.0 | Too fast | 24.0 |
| 4 | Divide by $2^{14}$ | 30.0 | 60.0 | 6.1 |
| 5 | Divide by $2^{16}$ | 7.6 | 15.2 | 1.5 |

# Specifications

| | |
|---|---|
| Spectral range: | 220-750 nm |
| Approximate dimensions: | 14 cm x 10.5 cm x 4 cm (LWH)<br>5.5" x 4.1" x 1.5" (LWH) |
| Power input: | 1.3 A @ 11V @ 220 Hz<br>100 mA @ 12V @ 10Hz |
| Trigger input: | external TTL positive pulse via 15-pin connector |
| Output: | 45 millijoules per pulse maximum<br>9.9 watts average power<br>220 Hz pulse rate maximum |
| Pulse duration: | 5 microseconds (at 1/3 height of pulse) |
| Lifetime: | $10^9$ pulses (estimated 230 days continuous operation at 50 Hz pulse rate) |
| Aperture: | 3 mm |
| Connector: | SMA 905 |
| Timing signals available from S2000 spectrometers: | Multiple mode = up to 220 Hz (varies with A/D sampling frequency)<br>Single mode = varies with scan rate |