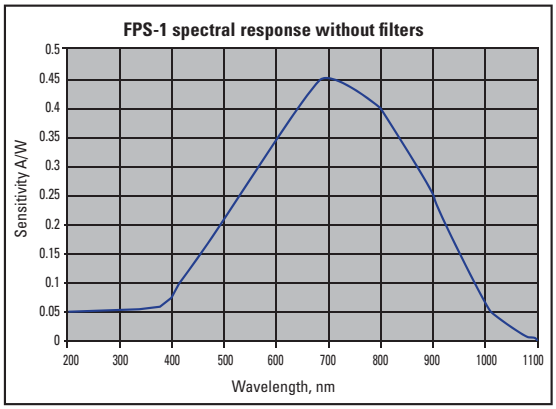
6. Spectral Response

A graph of the approximate relative spectral response of the FPS-1 is given below. This graph represents the sensitivity without the additional filters.



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FPS-1 Quick Reference

FPS-1

Fast Photodiode Detector
for Temporal Measurements

1 General Description

The FPS-1 fast photodetector is designed to measure the temporal behavior of pulsed lasers. The FPS-1 has two modes of operation:

a. High speed and low sensitivity into 50Ω load with 1ns response time.
b. High sensitivity into 10KΩ with 3µs response time.

Additional filters can be purchased for the FPS-1 to adjust the sensitivity to the power level of the source. The FPS-1 comes with a stand and base and fiber adapters are available for the sensor as well.

1. Getting Started

Connections:
The FPS-1 can operate either from its internal battery or from the wall plug power supply. If you want to operate the FPS-1 from the power supply, plug the power supply into the socket marked 12VDC. Connect the output BNC to your oscilloscope with either 50Ω or 10KΩ termination resistance (see section 2).

To switch the battery on and off:
Switch the toggle switch marked “BAT” to “on”.
To switch off, switch to “off”. Note that this only switches the battery. If the FPS-1 is powered from the wall cube, it will not be switched off with this switch.

Battery check:
To check the battery status, press the small push button marked “BAT. STATUS”. If the green LED lights, the battery is OK.

2. Power vs. Time Measurement

The peak power of nanosecond pulses is usually very high and above the saturation level of the FPS-1. However, it is not necessary to look directly at the beam to measure properly. The beam can be scattered from a white surface and the FPS-1 can be placed at a distance from the beam to look at a small fraction of the beam. The distance from the scattering surface and the FPS-1 can be varied to get a good but not saturated signal. If the intensity is still too high, or it is not convenient to measure scattered light, filters are available to lower the laser intensity. See ordering information in section 5.

To measure pulsed lasers with the FPS-1:

1. Verify that the unit is switched on and the battery is in good condition.
2. If the laser pulse width is <3µs, make sure the BNC cable is terminated with a 50Ω termination. If the pulse is >3µs and the signal is not large enough, you can terminate the BNC cable with 10KΩ in order to increase the voltage level.
3. Try at first diffusing the laser beam off of a diffusive white surface and placing the FPS-1 at a distance of ~20cm from the surface. If the peak intensity is still too high, move the FPS-1 further away. If the intensity is still too high, one or more filters are recommended (see ordering information in section 5). If the intensity is too low, move the sensor closer to the laser spot.
4. If you are measuring a laser pulse through a fiber and are using the optional fiber adapter, first try the beam with several filters in and remove them as necessary.

3. Changing the Battery

In order to save the non-rechargeable battery, the FPS-1 can be operated with the wall plug power supply. If the battery is low, the "BAT. STATUS" light will not light up when the button is pressed. This means the battery should be changed. In order to change the battery, unscrew the screw next to the BNC output, remove the battery and insert a new A23 battery.

4. Maintenance

The detector probe should be periodically cleaned with tissue and alcohol. Otherwise no other care is needed for the instrument.

5. Specifications

Model	FPS-1	
P/N	7Z02505	
Detector	Silicon photodiode	
Spectral range	193nm – 1100nm	
Detector area	0.8mm²	
Spectral response	See graph in section 6	
Performance specifications	Into 50Ω load	Into 10KΩ load
Risetime 0 – 90%	1ns	3µs
Sensitivity at peak wavelength	0.15V for 1W/cm² input	60V for 1W/cm² input
Maximum output voltage	10V	
Output connection	BNC	
Power	12V A23 alkaline battery (40 hours lifetime). Can also be operated from 12VDC wall cube power supply (included).	
Input	Direct or scattered laser light or from fiber optics.	
Input thread	SM1 thread. One SM1 to M20 adapter is needed to fit FPS-1 to attenuators and fiber adapters (see below).	
Optional attenuators and fiber adapters (M20 thread)	Description	P/N
	IS6 adapter	7Z08289
	X10 nom. attenuator	7Z08200
	X50 nom. attenuator	7Z08201
	SM1 to M20 adapter	1G02259
	SMA fiber adapter	1G01236A
	FC, FC/APC fiber adapter	7Z08229
	ST fiber adapter	7Z08226
	SC fiber adapter	7Z08227
Battery	ALKALINE 12V 55MAH A23, EURO	7E05067
Wall cube power supply	220VAC 110VAC	7E05003 7E05017