

SPDP Laser Startup Procedure S-AB-P-042 Rev B

The SPDP 2-wavelength source is a Class IV laser system that consists of three active, light producing components. Two low power (~50mW) fiber lasers are used as inputs to a fiber amplifier that produces a collimated beam at full output power (~10W). With one of the low power “seed” sources pre-configured to 1053nm and the other to 1058nm, the full system can operate at either wavelength.

Appropriate eye protection must be worn by ALL individuals in the Laser Bay prior to turning the laser ‘ON’.

Startup Procedure:

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- 1 Request that the Shot Director enable the SPDP laser in the Facility Interlock Executive and make appropriate warning announcements in the facility.

 - 2 For EACH of the NP Photonics seed sources, verify that the output fiber is connected to the 2x2 fiber combiner.
Note: The 2x2 combiner is the small black rectangle with two yellow fiber inputs and two outputs.

 - 3 For EACH of the NP Photonics seed sources, find the ‘POWER MODE’ switch on the front panel and verify that it is in the ‘OFF’ position.
Note: The ‘POWER MODE’ switch enables an automatic power control loop, but this option is not available during the laser startup and warm-up. During this period the auto power control must be disabled.

 - 4 For EACH of the NP Photonics seed sources, verify that the ‘PUMP’ switch on the front panel is in its ‘OFF’ position.

 - 5 For EACH of the NP Photonics seed sources, verify that the ‘RIN Suppression’ switch on the front panel is in its ‘OFF’ position.
Note: The ‘RIN Suppression’ feature of the laser negatively affects output power stability and should not be enabled.

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For EACH of the NP Photonics seed sources, turn the safety key on the front panel of the laser unit from 'Standby' to 'ON' and wait for the 'Temp Stable' LED to illuminate.

- 6 The 'Temp Stable' light of each unit will turn on within 5 minutes. If it does not, the unit is defective. Shut down the unit as described in the shutdown procedure (SP-AB-P-043) and contact the manufacturer for assistance.

Note: When turning the unit 'ON', the LCD display will illuminate, showing the operating wavelength and the output power level.

For EACH of the NP Photonics seed sources, turn the 'Pump' switch on the front panel to its 'ON' position. *This step starts the diode pump current and causes light to be emitted from the seed source(s).*

- 7 Note: When the 'Pump' is enabled, the LCD display will indicate an increasing power level.

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- 8 Allow the NP Photonics seed lasers to warm-up for at least 15 minutes.

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- 9 While the seed sources are warming, prepare the IPG amplifier for operation. Verify that the power switch on the left rear of the amplifier is on. Then turn the safety key on the front panel of the IPG amplifier to the 'ON' position.

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- 10 On the front of the IPG amplifier press the 'SELECT' button until the 'CURRENT SETPOINT' is flashing, and then press the 'ENTER' button. Then use the number keypad to bring the set point down to 0.01A and press the 'OK' key when done. Do not use the rotary wheel or the 'INC/DEC' buttons.

Note: the display will read 0.0 A

After allowing the NP Photonics sources to warm up for 15 minutes, verify that the 'TEMP STABLE' LED is illuminated and that the '2nd MODE' LED is off for EACH of the NP Photonics seed sources.

- 11 The output power displayed on the front panel LCD of EACH unit should be greater than 50 mW (typically 55 mW). If not, the unit is defective and the manufacturer should be contacted for assistance.

For EACH of the NP Photonics seed sources, find the 'POWER MODE' switch on the front panel and switch it to 'ON'.

- 12 Note: The 'RIN SUPPRESSION' switch should remain in the 'OFF' position.

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- 13 Check the LCD panel on the front of the IPG amplifier for input power. The input power MUST be higher than 1mW but lower than 30mW before proceeding to the next step.
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- 14 Press the 'EMISSION' button on the front of the IPG amplifier. *This step starts the diode pump current and causes up to 700mW to be emitted from the laser system.* The red warning LED above the 'EMISSION' button will illuminate.
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- 15 Use an IR card or a viewing screen and an IR viewer to verify that a laser beam is leaving the fiber collimator.
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- 16 Press the 'SELECT' button until the 'CURRENT SETPOINT' is flashing, and then press 'ENTER'. Gradually increase the current using the keypad, the 'INC' button, or the rotary wheel until the output power reaches the level required for the diagnostic application the laser will be used.
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- 17 Allow the amplifier an additional 15 minutes of warm up time to reach a stable power output.
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- 18 Verify that a source beam propagates to the SPDP ASP. This may require adjustment of the waveplates on the SPDP that act as the source throttle and the upper/lower compressor split using the video output of the ASP as a monitor.

(End of Procedure)

Note: There are no user serviceable components on the laser unit. If the power output is not achieved, shut down the unit as described in the shutdown procedure (SP-AB-P-043) and contact the manufacturer for assistance.

S-AB-P-042 SPDP Laser Startup Procedure

Document Release:

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