

SPS AO CONTROLLER UNIT

The SPS Model AOTF Controller is a high performance radio frequency generator. It provides fast frequency sweep using phase lock loop incorporated into a self-contained case with AC power supply. A modular cable with a DB9 connector interface allows frequency control via the personal computer's serial port. Applications for this driver include AOTF wavelength controller for both TeO₂ and Quartz devices and level intensity output of incoherent or coherent light source at any wavelength with built-in feedback loop. The synthesizer software provides frequency and amplitude control of the output RF signal when the driver is connected to a PC's serial port. Operating systems of Windows 95/98/98SE/2000/XP/VISTA versions are all supported¹. The program has an easy to use graphical interface for controlling the SPS, which can control up to 8 channels of RF signal.

The features of this driver include

- Control of AO operation in either frequency or wavelength domain.
- Wavelength-frequency calibration by customer.
- Three scan modes (stop, loop, and bounce) for both sweep and hopping.
- Control up to 8 RF output channels.
- Sweep or hopping of more than one channel at the same time.
- Minimum 15ms frequency sweep interval.
- Minimum 20ms frequency hopping interval.
- Standard 1000 frequency hopping steps. Up to 65000 steps upon customer's request.
- Synchronization output during scan operation.
- Optional using of another serial port as trigger output.
- Customer accessible configuration file (including frequency and amplitude range control)

Computer Requirements

- A Pentium compatible computer (>100MHz).
- Windows® 95/98/98SE/NT/2000/XP/VISTA.
- An unused serial port is required.
- A second unused serial port only if a trigger output is needed.

¹ The software has not been tested for Windows® ME/XP when this document is written.



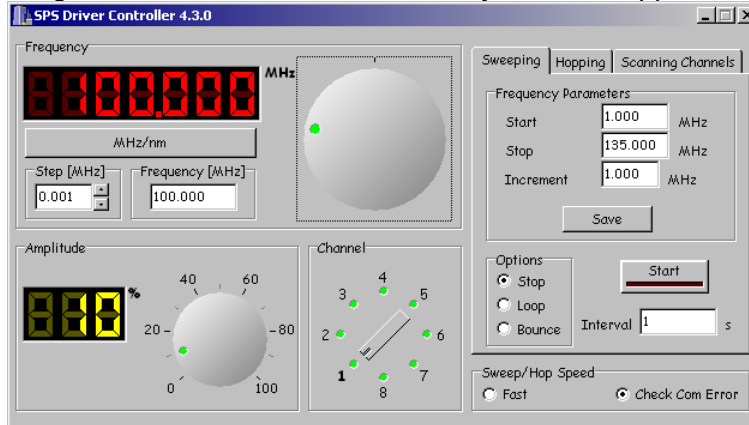
Options

AM: Analog or digital (TTL) inputs are available to amplitude modulate the output.
CA: 36" RF Cable

Software Provided

1. A program written in C++ allows for frequency and timing control of the synthesizer when connected to a PC's serial port.

Single or Multichannel Channel RF Synthesizer Application



In this application the user can control the RF synthesizer's frequency and amplitude.

The top left section of the main window displays the frequency. The user can change the RF frequency by typing the value in the edit box provided or by changing the knob position. The knob's position can be changed with the mouse or by pressing the arrow keys or page up/down keys. The arrow keys change the frequency by the step while the page up/down keys change by the step times 10.

The bottom left section is used to set the amplitude of the RF signal. The amplitude can be set by changing the knob position. The arrow keys change by 1% and the page up/down keys by 10%.

The middle bottom section is used in the multichannel driver. When the software controls the single channel driver the rotary switch is disabled.

The right section of the main window is used to specify parameters for the sweeping and hopping modes. In a multichannel version, the software allows to sweep or hop on one channel at a time.

Initially in the sweeping mode the frequency parameters are set to the parameters specific to the Synthesizer: The start frequency is set to minimum, the end frequency to maximum and the step size to minimum.

The additional options specify the way the sweep will be executed.

STOP - at the end of the range the sweeping will stop

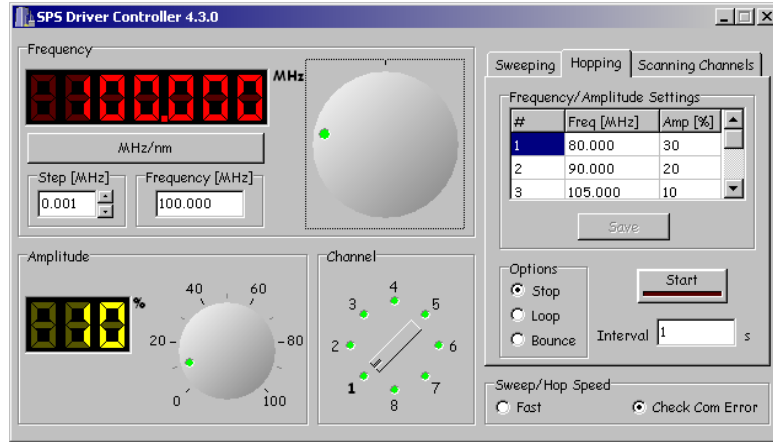
LOOP - when the end of the range is reached the sweep starts over from the start frequency until the stop button is pressed.

BOUNCE - at the end of the range the sweep will start in the other direction towards the beginning of the range. When the beginning of the range is reached the sweep will start



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again. This sequence will be repeated until the stop button is pressed. The change interval specifies, in seconds, the gap between the consecutive frequency updates.



NOTE: Since Windows is not a real time operating system the time intervals is the application time not a real time. It means that if the operating system schedules some time to execute other applications in the system the real time interval can be different then the specified. The frequency hopping section provides the table for the frequency and amplitude values. The parameters change start with the first entry in the table. The maximum number of frequency-amplitude pairs is 10. As with the sweeping setting the RF signal parameters can be changed in STOP, LOOP or BOUND modes.

In multichannel type of drivers user can scan (sweep or hop) more than one channel at the same time, while keep the rest unchanged. This is done by uncheck those channels the user wants to keep a constant frequency and amplitude in the “Scanning Channels” tab. When the program is start, all available channels are set as scanning by the program.

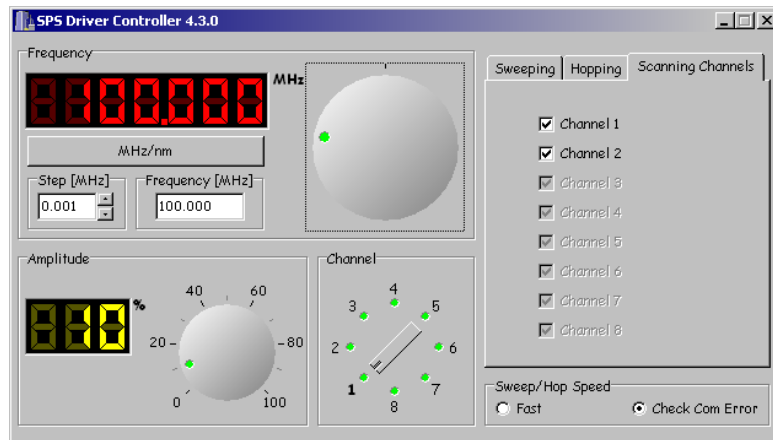


Figure 5. The user can specify which channels to scan when the start button is clicked.

2. Direct access to the driver is also available using ASCII commends. Setting the channel number, frequency and amplitude directly through the RS232 port can be done as follow:



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1. Selecting the channel:

Cx[cr] x is the channel number 1-n

2. Changing the frequency (in a selected channel)

Fxxx.xxx[cr] where: xxx.xxx is the frequency in MHz
[CR] is character of ASCII code 13 (0dh)

NOTE: All 3 characters after the decimal point MUST be present (event if 0).

Example:

f123.120[cr] sets the frequency to 123.120 MHz

f98.100[cr] sets the frequency to 98.1 MHz

3. Setting the amplitude (in a selected channel)

Axxx[cr] where: xxx is the amplitude in % <0%; 100%>

Example: a10 sets the RF output to 10%



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