

# SR2021

## Rubidium frequency generator

The equipment is a high precision frequency generator. The equipment is presented in the form of a 19 " rackable drawer, 2 U height.

The equipment integrates a high stability and low noise Rubidium oscillator.

The front face of the equipment present:

- 5 LEDS giving the current state of the five outputs frequencies.
- A LED tension presence
- A LED indicating the current state of Rubidium (green: the parameters of operation are OK. Red: the parameters are out, which is the case during "the warm-up" or launching phase)
- A multi-turn potentiometer allows a retiming of the oscillator in the event of need.

**Internal pilot:** high stability

**Output Frequency:** frequency available 10 MHz or 5 MHz sine. Level +13 dBm max out of 50 Ohm.

**Connector:** female base plates BNC for the sine outputs, SubD 9 points for RS232 remote control connection of the equipment.

**Dimensions:** L = 19 " (483 mm), H = 2U (89 mm), P = 295mm, Overall: 483 X 45 X340 Misters.

**Weight:** 5 kg

**Consumption:** 30 W

The signals outputs are carried out on the rear face of the equipment. The connectors are five:

- Five 10 MHz sine outputs,
- Five multi-turn potentiometers allow the adjustment of the level of each output.

A standard EEC 230V AC connector with fuse, filter sector and On/Off switch is used for power supply.



## Specifications

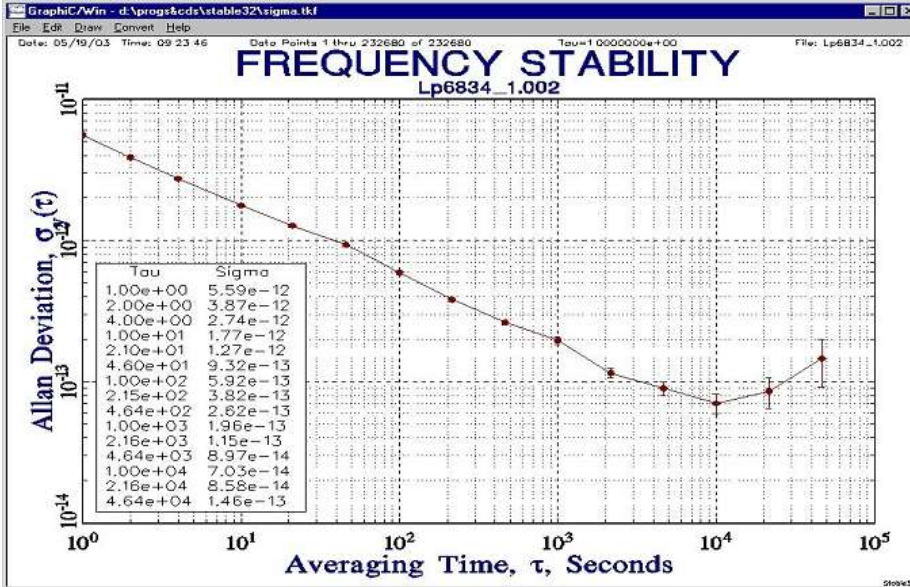
long term Stability	< 5x10 <sup>-11</sup> /mois (typical ±1x10 <sup>-11</sup> )	< 3x10 <sup>-11</sup> /mois (typical ±1x10 <sup>-11</sup> ) <b>Option A</b>	
short term Stability		<b>Standard</b>	<b>Option S</b>
	1s	3x10 <sup>-11</sup>	1x10 <sup>-11</sup>
	10s	1x10 <sup>-11</sup>	3x10 <sup>-12</sup>
	100s	3x10 <sup>-12</sup>	1x10 <sup>-12</sup>
phase noise		<b>Standard</b>	<b>Q3 option</b>
	1 Hz	- 70 dBc/Hz	- 80 dBc/Hz
	10 Hz	- 80 dBc/Hz	- 100 dBc/Hz
	100 Hz	- 115 dBc/Hz	- 130 dBc/Hz
	1 KHz	- 135 dBc/Hz	- 140 dBc/Hz
	10 KHz	- 140 dBc/Hz	- 150 dBc/Hz
Warm-up	< 15 minutes to reach 5x10 <sup>-10</sup>		
Adjustment of the pilot frequency	2.5x10 <sup>-9</sup> (1x10 <sup>-11</sup> resolution) ±20%		
Outputs Level	Sine 13 dBm out of 50 Ω, adjustable individually by step of ±1 dB		
Insulation enters the exits	> 20 dB		
Harmonics	<-25 dBc	<-40 dBc ( <b>option X</b> )	
Spurious	<-80 dBc	<-110 dBc ( <b>option X</b> )	
Sensitivity to temperature	< ± 1x10 <sup>-10</sup> on the beach: -5°Cwith +55°C		
Sensitivity to magnetic field	< 2x10 <sup>-11</sup> /Gauss for axes X and Y. < 1x10 <sup>-10</sup> on axis Z.		
T° of storage	-55°Cwith +85°C		
T° of operation	-25°Cwith +55°C		
Humidity	35°C, 95% of relative humidity		
Pressure/altitude	Equivalent at an altitude of 2000 m		
MTBF equipment	90.000 hours		
MTBF Rubidium	175.000 hours		
EEC Standards	73/23/EEC Low Voltage Directive. IN 60950 electrical and mechanical safety.  89/336/EEC Electromagnetic Compatibility  IN 50081-1 Emissions; IN 55022 Class B; IN 55103-1; IN 50082-1 Immunity; IN 55024; IN 55103-2		

## Remote Control

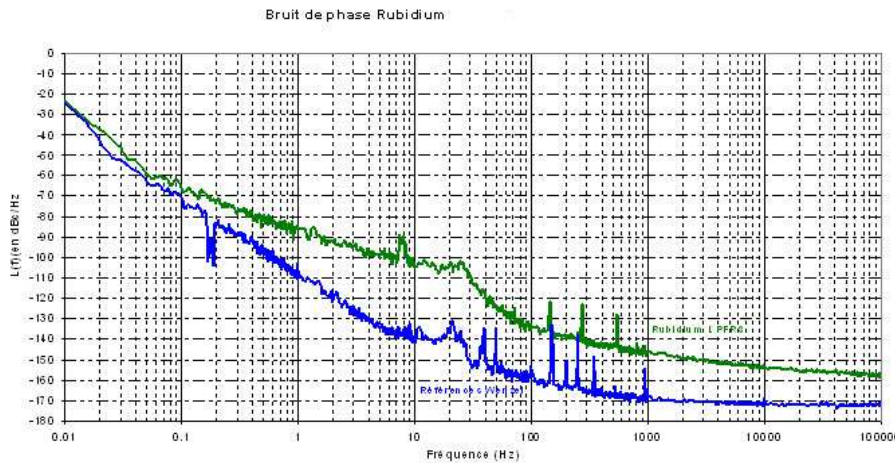
- RS232 connector, SubD 9 pins
- Accessible parameters:

Parameters related to the Rubidium cell	Parameters related to the equipment
Tension (cd.) of the rubidium cell (0-5V)	Test of the signal presence on each output
Signal peak of Rb (0-5V)	global test of the current status of rubidium (LED front face)
Reading of instruction control of adjustment of the frequency (0 to 5V)	
Heater current of the cell (0-500 my)	
Output of the frequency correction, by step of 1x10 <sup>-11</sup>	

## Short Term Stability



## Phase Noise



Variation with carrying (Hz)	1	10	100	103	104	105
Specification (dBc/Hz)	-80	-100	-130	-145	-153	N.S.
Measurements Rb (dBc/Hz)	-86	-103	-134	-147	-153	-158

