

October 29, 2019

**Smart, Low-Cost & High-Performance GPS/GNSS Disciplinable Rubidium Source**

## RBSource™ -1500

**Smart GPS/GNSS Disciplinable Rubidium Source**  
**SmarTiming+® 1ns-Resolution Disciplining Technology Inside**



The RBSource is a low-cost, high-performance GPS/GNSS disciplinable Rubidium reference source. It integrates a smart Rubidium clock and uses the GPS/GNSS SmarTiming+® technology, disciplining the Rb clock with an auto-adaptive loop time constant of 1,000 to 100,000 seconds, depending on the GPS/GNSS signal quality, at cutting-edge 1ns resolution. It's designed for cross-industry applications, where high stability and timekeeping features is a driving requirement.



### Key Features

- Integrated Rb clock
- Integrated GPS/GNSS disciplinable Rb clock function, using SmarTiming+® technology at 1ns resolution
- Output Frequencies (8x 10MHz / 8x 1PPS or 16x 10 MHz)
- Integrated smart auto calibration
- Internal Bit Alarm
- RS232 standard interface (9600 b/s)
- Windows 7, XP software application
- Power supply voltage (AC input 100-240 VAC / 50-60Hz)
- Compact 1U rack mountable chassis

### APPLICATIONS

**Synchronization | Timing | Reference/Test Source | Time/Frequency Source**

**SPECIFICATIONS**

**ELECTRICAL**

Spec	RBSOURCE-1500	
Reference module	Standard	Options
RFOUT Frequency Number of Output	10MHz 8x backplane 1x faceplate	10.23MHz 16x backplane RF (no PPS) 1x faceplate <b>(ordering code: 16RF)</b>
PPSOUT Functionality Number of Output	1PPS See SMARTIMING+ 8x backplane 1x faceplate	1PPS See SMARTIMING+ <b>(ordering code: 16PPS)</b> (no RF) 1x faceplate <b>(order code: S)</b>
Short Term Stability		<b>(ordering code: LN)</b>
1s	2E-11	1E-11
10s	8E-12	3E-12
100s	3E-12	1E-12
Phase Noise (dBc/Hz) (RFOUT: 10 MHz)		<b>(ordering code: LN)</b>
1Hz	-80	-100
10Hz	-100	-130*
100Hz	-125	-145
1kHz	-145	-155
10kHz	-145	-155
Aging (Measured after 3 months of continuous operation)	< 5E-11 / month (typical: 3E-11 / month)	< 3E-11 / month or 2E-10 / year <b>(order code: A)</b> (typical: ±1E-11 / month)
Frequency Retrace Off/On (In stable temperature, gravity, pressure and magnetic field conditions)		< 5E-11 24 hr / 1 hr
RFOUT Levels Output faceplate Output backplane Impedance Harmonics Spurious f <sub>0</sub> ± 100kHz (SYNTH Off)		Sine wave, 0.5 Vrms, ±10% Sine wave, 1.0 Vrms, ±10% 50 Ω ±20% < -25dBc < -80dBc

**SMARTIMING+® FUNCTIONALITY**

Spec	RBSOURCE-1500	
Disciplining module	Standard	
PPSREF Level Reference input types Disciplining & filtering Disciplining mode	CMOS 0-5V or 0-3.3V rising edge GPS/GNSS, E1, T1, Cesium, Maser Auto-adaptive SmartTiming+® technology Sync (phase alignment) or Track (freq. alignment)	
PPSOUT Output level Pulse width (PW) or duty cycle	1PPS CMOS 0-5V (±20 mA sink/source) User settable, 0 to 1s in 133ns/step	
PPSOUT to PPSREF Sync Error In Sync mode	<50 ns No GPS PPSRef noise, ± 1°C temp fluctuations	
PPSOUT to PPSREF (DE) Programmable delay (In Track mode)	0 to 1s in 133 ns steps	
PPSOUT Holdover Time Stability	Within ± 2°C 1µs/24 hr	
Smart Loop Time Constant Phase/Frequency User settable	Auto-adaptive 1000 to 100,000 sec User settable Sync/Track mode ** Selected by RS232 interface ** Sync: phase/time alignment; Track: frequency alignment	

**POWER**

Spec	RBSOURCE-1500	
	Standard	
Power Supply	AC input 100-240 VAC	
Power Input Fluctuation	±10% of nominal supply voltage (230V-)	
Input Frequency	50 – 60 HZ	
Power Consumption @25°C	< 25W after warm-up	
Current	1.5 – 0.65A	
Connector Type	IEC plug	

**ENVIRONMENT**

Spec	RBSOURCE-1500	
	Standard	
Operating Temperature	0 to 40°C (Relative humidity: 10-85%)	
Storage	-25 to 55°C	
Transportation	-25 to 70°C	
Max Altitude	10'000 Ft	

**PHYSICAL**

Spec	RBSOURCE-1500	
	Standard	Option
Size	445 x 300 x 44 mm (1U) / 17.52 x 11.81 x 1.73 in.	
Weight	2.2 kg / 4.85 lbs	
Mounting	Tabletop feet	19" rack mountable ears <b>(ordering code: E)</b>

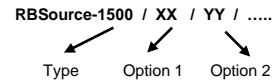
**SYSTEM SUPPLY**

Type	RBSOURCE-1500	
1x	RBSOURCE-1500	
1x	Cables SUB-D male/female for PC serial COM	
2x	19" rack mountable ears or tabletop feet (option E)	
1x	iSyncMgr application, user manual & spec	
1x	Euro Power Cable Standard	US Power Cable <b>(ordering code: US)</b> China Power Cable <b>(ordering code: CN)</b> Swiss Power Cable <b>(ordering code: CH)</b> Indian Power Cable <b>(ordering code: IN)</b>

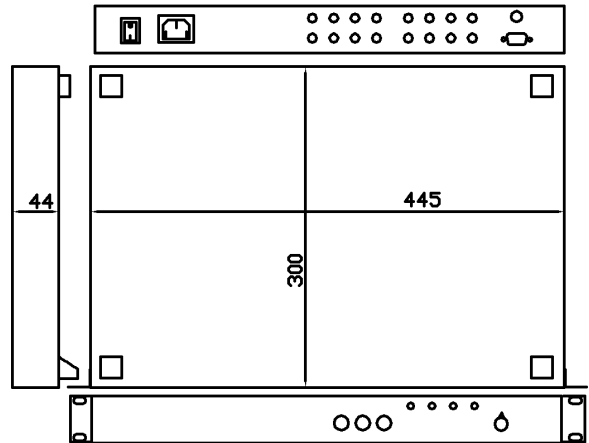
**SOFTWARE UPGRADES**

RBSOURCE-1500	
Download the latest software upgrades at <a href="http://www.spectratime.com">www.spectratime.com</a>	

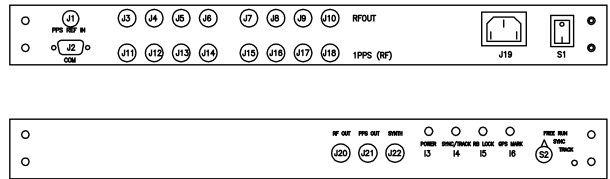
**ORDERING INSTRUCTIONS**



**MECHANICAL LAYOUT**



**I/O INTERFACES**



**Back Panel**

N°	Type	Definition	I/O
J1	SMA	1pps input	I
J2	SUB-D9-F	Serial communication RS232 Pin 2 Tx/D / Pin 3 Rx/D / Pin 5 GND	I/O
J3-J10	SMA	8x 10MHz sine reference outputs	O
J11-J18	SMA	8x 1PPS outputs (8x 10 MHz sine reference outputs with option code 16RF)	O
J19	IEC PLUG	Power connection	I
S1	SWITCH	On/Off switch	-

**Front Panel**

N°	Type	Definition	I/O
J20	BNC	10MHz sine reference output	O
J21	BNC	1PPS output	O
J22	BNC	SYNTH output (optional)	O
I3	Green LED	Power indicator	-
I4	Green LED	Sync or Track mode enabled	-
I5	Red LED	Rubidium clock locked alarm	-
I6	Green LED	1PPS GPS applied	-
S2	SWITCH	Free run, Sync or track selection switch	-