

## RBSource™-1600-DUAL

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 redundant Rb clocks
- Integrated GPS/GNSS disciplinable Rb clock function, using SmarTiming+® technology at 1ns resolution
- Output Frequencies 2\*10MHz
- Integrated smart auto calibration
- Internal Bit Alarms
- RS232 standard interface (9600 b/s)
- Redundant Power supplies, voltage (AC input 100-240 V 50-60Hz)
- Compact 1U rack mountable chassis

### Applications

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

**SPECIFICATIONS**  
**ELECTRICAL**

Spec	Smart SRO-5680 inside				
Type	<b>Standard</b>				
RFOUT Frequency	10 MHz				
Frequency Change Operating temperature range (Thermal chamber with air flow)	< 2E-10 -10°C to +60°C	<b>Option code: E65</b> < 2E-10 -10°C to +65°C			
Frequency Accuracy @ Shipment	< 5E-11 (+25°C), typical				
Aging (After 3 months of continuous operation)	< 5E-11 / month (typical: 3E-11 / month)				
Short Term Stability		<b>w/LN,ULN or EULN</b>	<b>STS1</b>		
1s	2E-11	5E-12	3E-12		
10s	8E-12	4E-12	3E-12		
100s	2E-12	2E-12	3E-12		
Phase Noise (dBc/Hz) (RFOUT 10 MHz)		<b>(Option codes)</b>			
		<b>LGS</b>	<b>LN</b>	<b>ULN</b>	<b>EULN</b>
1 Hz	-75	-85	-100	-103	-110
10 Hz	-95	-130	-130*	-133*	-138*
100 Hz	-125	-155*	-145	-153*	-150*
1k Hz	-145	-162	-155	-158	-160
10K Hz	-145	-164	-155	-161	-170
* Subject to export control (end user statement required)					
Frequency Retrace Off/On (In stable temperature, gravity, pressure & magnetic field conditions)	< 5E-11 24 hr / 1 hr				
Warm-up Time @ +25°C Frequency stability	12 min 5E-10				
Analog Frequency Adjustment Tolerance	$5 \times 10^{-9} \pm 20\%$				
<i>[An external voltage (0-5 VDC) can be applied to pin 6 (FA). The cursor pin of a 10 kΩ variable resistor placed between pin 7 and GND can provide this voltage. If not used, pin 7 must be floating]</i>					
Digital Frequency Adjustment Internal crystal oscillator freq. Resolution (Through RS-232 commands)	$\pm 1.67E-8$ 60MHz 5.12E-13				
RFOUT Output level Output impedance	Sine wave 0.5 Vrms ( $\pm 10\%$ / 50Ω) 50 Ω $\pm 20\%$				
Harmonics Spurious f0 $\pm 100$ kHz (DDSout off) 60MHz sub-harmonics	< -25dBc < -80dBc < -45dBc	<b>(Option code X)*</b> < -40dBc < -110dBc < -70dBc			

Supply Voltage (DC)	24V	<b>(with LN, ULN, EULN* or LGS option)</b> 12V (12V ± 5%)
Max Power Supply Ripple	< 50 mV peak to peak (from 1Hz to 1 MHz frequencyband)	
Input Power Warm up @+25°C (typical)	<28W @12V or <32W @24V	<b>(with LN, ULN, EULN* or LGS option)</b> < 32 W @12V
0°C	< 20 W	< 23 W
+25°C	< 13 W	< 15 W
+60°C	< 7 W	< 9 W
Communication Interface Protocol speed Compatible with	RS-232 commands for control & monitoring (see commandsbelow) Timing and locking control functions VMGA messages 9600, n, 8, 1 SRO model	
Conformal coating (CC)	None	CC <b>(option code: CC)</b>

\* 'EULN' & 'X' options cannot be selected together

**ENVIRONMENTAL**

Spec	Smart SRO-5680	
Magnetic Field Sensitivity	< 2E-10 / Gauss in worst axis	
Storage Temperature	- 55°C to + 85°C	
Humidity	GR-CORE-63, Section 5.1.2	
Operating Vibration	GR-CORE-63, Section 5.4.2 Random and Sinusoidal MIL-PRF-28800F, Class 3, 4	Ruggedized <b>(ordering code: VIB)</b> Profile: MIL-STD-810F, Method 514.5, Category 24 Average acceleration: 7.7g rms Duration: 1 hour/axis Axis: on each X/Y/Z axis
Low g sensitivity	n/a	<b>(ordering code: LGS)</b> 2E-10/g per axis
Shock	Survival: 40g / 11ms	
Helium concentration sensitivity	< 1E-10 per ppm of Helium concentration change	
G-Tip-Over Test	< 2E-10 / g in worst axis	

## POWER

Spec	RBSource-1600-dual
	<b>Standard</b>
Power Supplies	AC input 100-240 VAC
Power Input Fluctuation	±10% of nominal supply voltage (230V~)
Input Frequency	50 – 60 HZ
Power Consumption per channel :	@25°C < 25 W after warm-up
Absolute maximum current Current	< 1A (100VAC) – < 0.5A (220VAC)
Connector Type	IEC plug (one per channel)

## PHYSICAL

Spec	RBSource-1600-dual	
	Standard	Option
Size	445 x 300 x 44 mm (1U) / 17.52 x 11.81 x 1.73 in.	
Weight	~ 5 kg / ~ 11 lbs (TBC)	
Mounting	Tabletop feet	19" rack mountable ears <b>(ordering code: E)</b>

## SYSTEM SUPPLY

Type	RBSource-1600-dual	
1x	RBSource-1600-dual	
1x	Cables SUB-D male/female for PC serial COM	
2x	19" rack mountable ears or tabletop feet <b>(option E)</b>	
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-1600-dual	
Download the latest software upgrades at <a href="https://www.orolia.com/support-documents/?types=465,463&amp;products=332">https://www.orolia.com/support-documents/?types=465,463&amp;products=332</a>	

### ORDERING INSTRUCTIONS

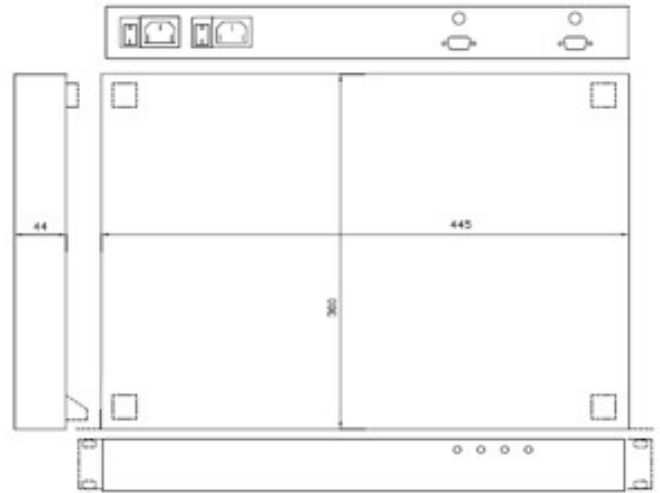
RBSource-1600-dual / XX / YY / .....



### Pin out J2 / J4 Sub-D 9 poles female

Pin	Fonction
2	RS-232-TXD
3	RS-232-RXD
5	Gnd RS-232
8	Gnd
9	Lock (open collector)
1,4,6,7	N.C

## MECHANICAL LAYOUT



## I/O INTERFACES



### Back Panel

N°	Type	Definition	I/O
J1	SMA	Rb A 10MHz outputs	I
J2	SUB-D9-F	Rb A Serial communication RS232 + OOL bit alarm	I/O
J3	SMA	Rb B 10MHz outputs	O
J4	SUB-D9-F	Rb B Serial communication RS232 + OOL bit alarm	I/O
J5	P. PLUG	Rb A Power connection	I
S1	SWITCH	Rb AO <sub>n</sub> /Off switch	-
J6	P. PLUG	Rb A Power connection	I
S2	SWITCH	Rb AO <sub>n</sub> /Off switch	-

### Front Panel

N°	Type	Definition	I/O
I1	Green LED	Power ON rubidium A	-
I2	Red LED	Out-of-Lock alarm (OOL)	-
I3	Green LED	Power ON rubidium B	-
I4	Red LED	Out-of-Lock alarm (OOL)	-