

Rubidium Frequency Standard

AR83A-01

10 Outputs

Key Features

- ❖ 10 outputs:
 - 2 fixed outputs:
 - 10MHz (Sine) / 1PPS (50Ω/TTL)
 - 10MHz (Sine)
 - 8 customized outputs selected from: 10MHz, 5MHz, 1MHz (Sine/Sqr), 1PPS (50Ω/TTL), 5MHz/1PPS_iDEN, E1, T1 or other frequencies.
- ❖ Aging < 5E-11 per month, < 5E-10 per year
- ❖ 1PPS accuracy < 50ns when disciplined to Ext. 1PPS
- ❖ Holdover: 1μs/24 hours
- ❖ RS232 Input/Output for remote control and status.
- ❖ Digital frequency adjust < 1E-12 steps, > 5E-7 range and BIT status
- ❖ Setup and Control GUI for Windows XP O/S (option)
- ❖ Supply Voltage: 90-260 VAC or 22-32 VDC (option)
- ❖ Ruggedized for harsh environment (option)
- ❖ Low Phase Noise (option)



Description

The AR83A-01 is a 1U, 19" rack-mount Rubidium Frequency Standard. The AR83A-01 offers standard configuration (see "how to order" on the last page). The product can also offers customize outputs configuration of 2 fixed: 10MHz (Sine), 1PPS (50Ω/TTL) and 8 customized outputs selected from: 10MHz, 5MHz, 1MHz (Sine/Sqr), 1PPS (50Ω/TTL), 5MHz/1PPS_iDEN, E1 or T1. Contact factory for more information. All outputs follow the atomic stability and provide excellent phase-noise, Harmonic and Spurious.

The unit may also be disciplined to an external 1 Pulse-Per-Second (1PPS) via an internal Digital PLL circuit. The 1PPS may be derived, for example, from an external GPS receiver.

A built-in synthesizer allows (in free running mode) a very fine digital frequency control through standards interface RS-232. The AR83A-01 is a Ruggedized product suitable to work in field conditions in various applications.

Note:

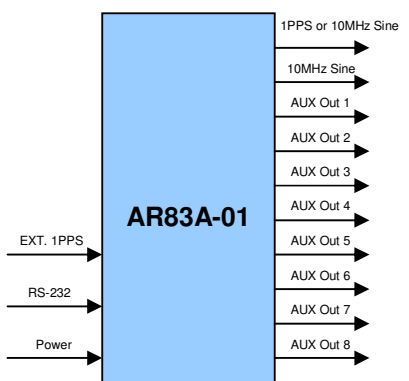
The AR83A family of products includes also the AR83A-11 which is similar to the AR83A-01 but includes a GPS receiver. In this unit the Rubidium clock is synchronized to the Global Positioning System (GPS), thereby providing extremely accurate time & frequency. See AR83A-11 detailed specification for more information.

Applications

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|--|-----------------|-------------------------------------|
| ❖ Wireless communication | ❖ Navigation | ❖ Software Defined Radio Technology |
| ❖ Wire line / Network/ Computers communication | ❖ Power Utility | ❖ Scientifics & Calibration |
| | ❖ Transport | ❖ Digital broadcasting systems |

SPECIFICATIONS

All specs are at room temperature, quiescent conditions, sea level ambient unless otherwise specified

Input & Outputs		
Outputs	10 outputs: <ul style="list-style-type: none"> • 2 fixed outputs: <ul style="list-style-type: none"> • 10MHz (Sine) / 1PPS (50Ω/TTL) • 10MHz (Sine) • 8 customized outputs selected from: 10MHz, 5MHz, 1MHz (Sine/Sqr), 1PPS (50Ω/TTL), 5MHz/1PPS_IDEN, E1, T1 or other frequencies (for outputs configurations see Standard Configuration table). 	
Input	1 PPS – TTL/ 50Ω Inputs priorities for synchronization: (1) External 1PPS, (2) Free running Rubidium-Standard (Holdover mode)	
Monitor & Control	RS-232- Baud rate: 19,200, Control: 1, N, 8	

Performance				
Frequency	Long Term Stability	Free running Rubidium-Standard (Holdover mode)	$<5E-11$ / month (from 2nd year) $<2 E-9$ / year (1st Year) $<5E-10$ / year (2nd year)	
		Disciplined to: Ext. 1PPS	$< 2E-12$ (24 hrs average)	
	Short Term Stability	$< 3E-11$ @ 1sec $< 5E-12$ @ 100sec		
	Temperature Stability	$\pm 2E-10$ max. / $-10^{\circ}C$ to $+50^{\circ}C$; $\pm 5E-11$ / $+10^{\circ}C$ to $+40^{\circ}C$		
	Phase Noise (*)	Standard Phase Noise	Low Phase Noise – Option (Typ.)	
		$< -95dBc/Hz$ @ 10Hz $< -130 dBc/Hz$ @ 100Hz $< -140 dBc/Hz$ @ 1KHz $< -145 dBc/Hz$ @ 10KHz	$< -96dBc/Hz$ @ 1Hz $< -126dBc/Hz$ @ 10Hz $< -144dBc/Hz$ @ 100Hz $< -150dBc/Hz$ @ 1KHz $< -150dBc/Hz$ @ 10KHz	
	Harmonics (10MHz)	$< -40dBc$		
	Spurious (10MHz)	$< -75 dBc$ @ $\pm 100KHz$ from carrier		
	Warm-up	5 minutes to lock $< 5E-10$ within 7 minutes $< 5E-11$ within 1 hour from start		
	Level	$13 \pm 2dBm$		
Retrace	$< 5E-11$ within 1 Hr from start (after < 24 Hrs shut off and at the same conditions)			
Accuracy @ shipment	$< 5E-11$			
Time (1PPS)	Long- term accuracy	Disciplined to: Ext. 1PPS	$< 100ns$ RMS @ $25^{\circ}C$ ($< 50ns$ Typ.)	
		Free running Rubidium-Standard (Holdover mode)	$1\mu s$ / 24 hours (after loss of synch)	

(*) This phase noise values are for main output J6. For all other AUX outputs the phase noise may be degraded up to 3 dB.

Environmental	
Operating Temperature	$-10^{\circ}C$ to $+50^{\circ}C$ (wide temperature range is optional)
Storage Temperature	$-30^{\circ}C$ to $+70^{\circ}C$
Humidity	Up to 95% at $35^{\circ}C$, non-condensed

SPECIFICATIONS *(continue)*

All specs are at room temperature, quiescent conditions, sea level ambient unless otherwise specified

BIT

LED Indications	4 LEDs on the front panel: Power, Status, Lock to GPS, Lock to Ext
	LED on each output

Power Supply

AC	90-260 VAC 47/63 Hz (standard)	
DC	22-32 VDC (option)	
Power Consumption	@ steady state	< 25W
	@ start (<5 min)	< 40W

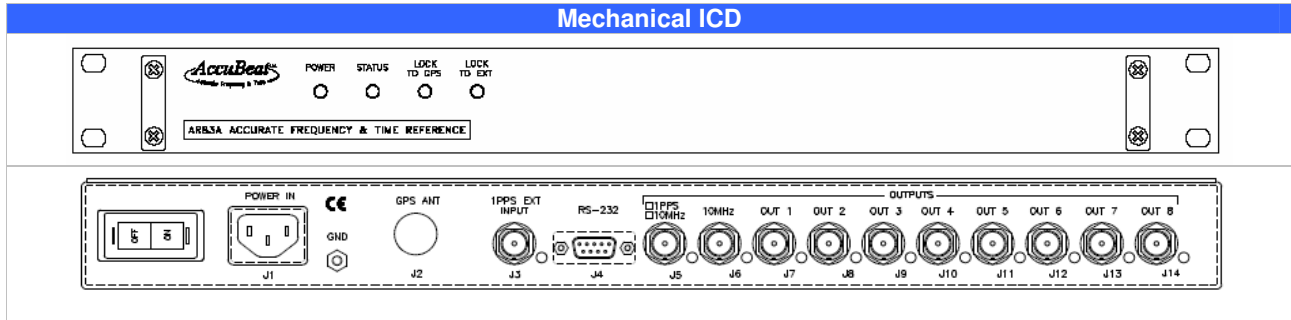
Dimensions & Weight

19" x 1U Rack Mount	Size	43.7 (high) x 347 (depth) x 483 mm (width) / (19", 1U)
	Weight	< 4 kg

Standards

CE Compliance	Safety per IEC950 / UL1950 / EN60950. EMI / EMC per EN50081, EN50082, EN50024 and FCC Part 15 Class A.
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Mechanical ICD



Electrical ICD

<u>Connector</u>	<u>Standard Type</u>	<u>Optional</u>
o J1 - Power Supply	Standard Inlet	
o J2		
o J3 - Extern 1PPS	BNC	TNC (Ruggedized option)
o J4 - RS232	D-Type	
o J5-14	BNC	TNC (Ruggedized option)

HOW TO ORDER

AccuBeat P/N:	Configurations									
	J5 Fixed 1	J6 Fixed 2	J7 Output 1	J8 Output 2	J9 Output 3	J10 Output 4	J11 Output 5	J12 Output 6	J13 Output 7	J14 Output 8
AR83001-00	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	5MHz Sine	1MHz Sine	1PPS	1PPS	1PPS
AR83001-01	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine
AR83001-02	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sqr	10MHz Sqr
AR83001-03	1PPS	10MHz Sine	10MHz SQR	10MHz SQR	10MHz SQR	10MHz SQR	10MHz SQR	10MHz SQR	10MHz SQR	10MHz SQR
AR83001-04	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	5MHz Sine	1MHz Sine	10MHz SQR	1PPS	1PPS
AR83001-05	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	5MHz Sine	5MHz Sine	5MHz Sine	1MHz Sine	1MHz Sine	1MHz Sine
	1PPS / 10MHz Sine	10MHz Sine	Configure your own frequency configuration. Optional frequencies are: 1MHz (Sine/SQR), 10MHz (Sine/SQR), 5MHz (Sine/SQR), 1PPS, 5MHz/1PPS. Iden (others customized frequencies like E1/T1 are available) NOTE: SOME COMBINATIONS ARE NOT AVAILABLE							

OPTIONS

Power Supply 28 VDC
Wide Operating temperature range -30°C to +60 °C

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