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 < 100ns 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.*
- *Ruggedized for harsh environment (option)*
- *Low Phase Noise (option)*

Description

The AR-83A-01 is a 1U, 19" rack-mount Rubidium Frequency Standard. The AR83A-01 offers three standard configuration outputs: (A) 10x10MHz, (B) 4x10MHz (sine/50Ω), 4x1PPS (TTL/50Ω), 1x5MHz (sine/50Ω), 1x1MHz (sine/50Ω) (C) 7x10MHz (sine/50Ω),2x10MHz (TTL),1x1PPS (TTL/50Ω).

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

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

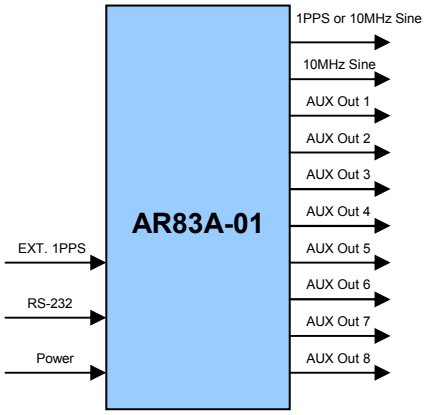
SPECIFICATIONS

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

Input & Outputs

Outputs	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 (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



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	± 2E-10max. / -10°C to+50°C; ; ± 5E-11 / +10°C to +40°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 @ ± 100KHz from carrier	
	Warm-up	5 minutes to lock < 5E-10 within 7 minutes < 5E-11 within 1 hour from start	
	Level	13±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°C (50n Typ.)
		Free running Rubidium-Standard (Holdover mode)	1µs / 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°C to +50 °C (wide temperature range is optional)
Storage Temperature	-30°C to +70°C
Humidity	Up to 95% at 35°C, non-condensed

SPECIFICATIONS *(continue)*

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

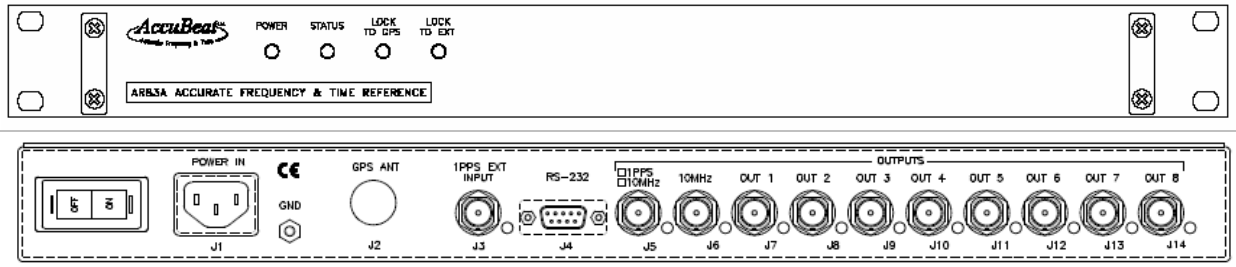
BIT		
LED Indications	4 LEDS on the front panel: Power, Status, Lock to GPS, Lock to Ext	
	LED on each output	

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.

Mechanical ICD



Electrical ICD

Connector	Standard Type	Optional
○ J1 - Power Supply	Standard Outlet	
○ J2		
○ J3 - Extern 1PPS	BNC	TNC (Ruggedized option)
○ J4 - RS232	D-Type	
○ J5-14	BNC	TNC (Ruggedized option)

HOW TO ORDER

OPTIONS	AccuBeat P/N:
Power Supply 28 VDC	By description
Wide Operating temperature range -30°C to +60 °C	By description
Ruggedized Option	By description

Standard configurations:

Configurations	J5 Fixed 1	J6 Fixed 2	J7 Output1	J8 Output2	J9 Output3	J10 Output4	J11 Output5	J12 Output6	J13 Output 7	J14 Output 8
1	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	5MHz Sine	1MHz Sine	1PPS	1PPS	1PPS
2	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	1PPS
3	1PPS	10MHz Sine	38.4MHz Sqr	38.4MHz Sqr	38.4MHz Sqr	38.4MHz Sine	38.4MHz Sine	38.4MHz Sine	1PPS	1PPS
4	1PPS	10MHz Sine	10MHz Sqr	10MHz Sqr	10MHz Sqr	10MHz Sqr	1PPS	1PPS	1PPS	1PPS
5	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sqr	10MHz Sqr
6	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sqr	10MHz Sqr	1PPS
7	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine
8	1PPS	10MHz Sine	10MHz Sine	10MHz Sine	10MHz Sine	5MHz Sine	1MHz Sine	10MHz Sqr	1PPS	1PPS
9	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								

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