

# GPS-Disciplined-Rubidium Clock

## AR70A-00

### Miniature GPS-Rubidium

#### Main Features

- Rubidium clock disciplined to GPS
- Outputs: 10MHz, 1PPS
- Inputs: External 1PPS, GPS antenna
- Time Accuracy: 100ns relative to GPS
- Frequency Accuracy: 5E-12
- Holdover (no GPS): 1µs/24hours, 5E-11/month
- Compact: 114 x 41 x 81 mm < 0.55 Kg
- Time & Navigation Data – RS232
- Supply Voltage: 15 VDC



#### Description:

The compact AR70A-00 products offer **Rubidium Atomic Standards** which are disciplined to the **Global Positioning System (GPS)**, thereby providing extremely accurate and stable time & frequency. The AR70A-00 model includes a Rubidium Standard, a GPS receiver, an external 1PPS input and a Rubidium-GPS disciplining circuit (Digital PLL). The Rubidium Standard is phase locked to the GPS or to the external 1PPS. All outputs are derived from the Rubidium Standard, which maintains the 10MHz and the 1PPS when GPS or external 1PPS inputs are interrupted.

Special Note: AccuBeat specializes in customized solutions based on the customer's distinctive requirements.

#### Applications

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|---|--|--|
| <ul style="list-style-type: none"> <li>▪ Test Equipment</li> <li>▪ Scientific Equipment</li> <li>▪ Calibration</li> </ul> | <ul style="list-style-type: none"> <li>▪ Military Applications</li> <li>▪ Secure Communication</li> <li>▪ TV Stations</li> </ul> | <ul style="list-style-type: none"> <li>▪ Cellular Phones Base Stations</li> <li>▪ Mobile Radio Base Stations</li> <li>▪ Telecommunication</li> </ul> |
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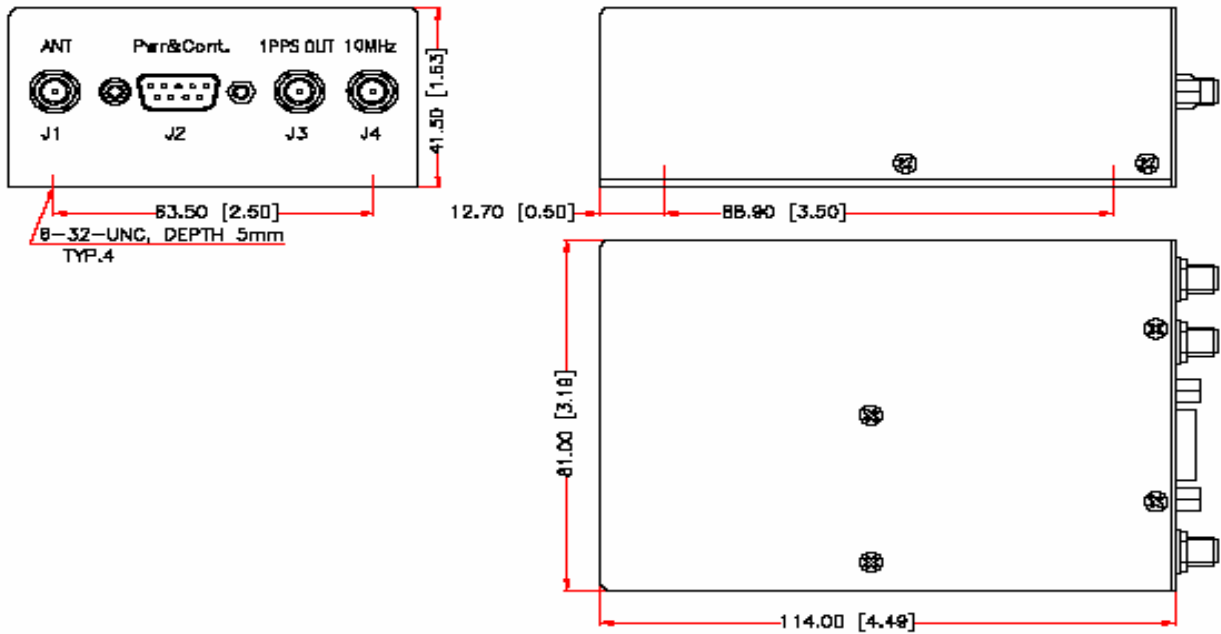
Specifications				
Accuracy	<b>Disciplined to GPS or to Ext. 1PPS</b>	Frequency	5E-12 (typ.)	24 hour average, 25°C
		Time	±100ns RMS (typ.)	relative to GPS or Ext. input @ 25°C without S/A
	<b>Holdover (no GPS)</b>	Frequency	5E-11 / month drift (typ.)	
		Time	1 µs/ 24 hours (typ.)	
<b>Short Term Stability</b>	3E-11 @ 1sec,			
<b>Phase Noise (Quiescent)</b>	<-100dBc/Hz @ 10Hz <-127dBc/Hz @ 100Hz <-138dBc/Hz @ 1KHz <-141dBc/Hz @ 10KHz			
<b>Harmonics</b>	-40dBc			
<b>Spurious</b>	-75dBc ±100KHz			
<b>Temperature Stability</b>	±2E-10 over -20°C to +65°C			
<b>Warm-Up Stability</b>	5E-10 within <7 min 5E-11 within < 60 min 1E-11 within <4hrs 5E-12 within <24hrs			
<b>Output &amp; Input</b>				
Output	1 x 10MHz Sine wave (10±2) dbm / 50Ω SMA			
	1 x 1PPS TTL / 50Ω SMA			
	PC channel (RS232) for Time & Navigation Data and Remote Control			
Input	GPS Antenna / 50Ω SMA			
	Ext. 1PPS / 50Ω D-Type			
Mode of operations	A. Disciplined to GPS			
	B. Disciplined to external 1 PPS			
	C. Auto Select : First Priority to External 1 PPS and Second to Internal GPS Receiver			
<b>Remote Setting</b>				
Via Graphic User Interface Software for PC	<u>Includes:</u>			
	<ul style="list-style-type: none"> <li>○ Time/date display</li> <li>○ Time source</li> <li>○ Time Zone</li> <li>○ Satellites Use</li> <li>○ Navigation data from GPS</li> <li>○ Leap seconds (from UTC to GPS)</li> </ul>	<ul style="list-style-type: none"> <li>○ BIT (Built in test)</li> <li>○ Antenna Cable Delay</li> <li>○ Ext Input Delay</li> <li>○ Daylight Saving/ STD</li> <li>○ Time Setting GPS/UTC/LOCAL</li> <li>○ Additional parameters</li> </ul>		

Specifications (Continue)	
<b>GPS Receiver</b>	
<b>GPS Tracking</b>	L1 frequency 1575 MHz C/A code (SPS) 8 parallel tracking channels
<b>Acquisition Time</b>	5 minutes (12.5 min cold start)
<b>GPS Position</b>	Latitude, Altitude, longitude
<b>Position Accuracy</b>	25m CEP (50%) w/o SA
<b>GPS Antenna DC Voltage</b>	5VDC
<b>Power Supply</b>	
<b>Input Voltage</b>	15 VDC / 1.3A @ warm-up, 0.6A @ steady state
<b>Dimensions &amp; weight</b>	
<b>Dimensions &amp; Weight</b>	114 x 41 x 81 mm ; <0.55kg
<b>Environmental</b>	
<b>Operating Temperature</b>	-20°C to +65 °C (base plate) / Operable up to 75 °C (base plate)
<b>Storage Temperature</b>	-40°C to +85°C
<b>Humidity</b>	Up to 95% at 35°C, non-condensed
<b>Vibration</b>	MIL-STD-810D, Method 514.3 ( 3 grms)
<b>Shock</b>	MIL-STD-810C, Method 516.2, Proc. I (15g / 11mSec / Half sine)
<b>Altitude</b>	< 45,000 feet
<b>MTBF</b>	
	@GB 30°C: 100,000 Hours. @AIC 30°C: 30,000 Hours

- All specifications are at 25°C at quiescent conditions unless specified otherwise.



## Mechanical and Electrical ICD



SMA J1 GPS ANTENNA	
D-Type J2 POWER & CONTR	
1	POWER IN
2	GND
3	LOCK SIGNAL
4	1PPS EXT IN
5	GND
6	Tx_pc (option)
7	Factory Used
8	N.C.
9	Rx_PC(option)
SMA J3 1PPS OUT	
SMA J4 10MHz OUT	

Accessories	
AccuBeat P/N	Description
EM30039	GPS Antenna 36 dB ,5VDC
AC50513	Antenna Cable SMA to TNC RG-142 10m
AC50513-01	Antenna Cable SMA to TNC RG-142 5m
SW50010	GUI Software for PC for Monitoring & Remote Control

How To Order	
Product Name	Description
AR70A-00	Above Specifications
AR70A-00/ With Additional Frequency	Above Specifications with different frequency in J3 instead of the 1PPS <ul style="list-style-type: none"> <li>o 1MHz (50% Duty cycle)</li> <li>o 2MHz (20% Duty cycle)</li> <li>o 5MHz (50% Duty cycle)</li> </ul>
Example: AR70A-00/5MHz	

AR70A-00 data sheet 15/02/09  
 THE BINDING SPECIFICATIONS ARE ONLY THOSE STATED IN OUR QUOTATION/PROPOSAL/CONTRACT.  
 THIS PRODUCT IS COVERED BY THE FOLLOWING U.S. PATENTS: 6130583. OTHER PATENTS PENDING.