

## AR75A – Low Cost GPS Disciplined OCXO Clock

### Key Features

- ❖ Frequency Accuracy : 1E-11
- ❖ 1PPS Accuracy: 100ns RMS
- ❖ NTP Server
- ❖ Outputs: 10MHz, 1PPS (TTL & RS-422& PTTI), TOD (Have Quick)
- ❖ Input: GPS antenna, 1PPS, TOD (Have Quick)
- ❖ Operating Temperature range: -5°C to +50°C (wide temp range opt.)
- ❖ Control and monitoring: RS-232 (Rx & Tx), RS-422 (Rx & Tx).
- ❖ Ephemeris, Almanac & Ionosphere Data (Opt.)
- ❖ AC Power 110/220V
- ❖ Graphic User Interface (GUI) Software for PC (Opt.)



### Description

The **AR75A** unit is GPS-Disciplined OCXO clock which offers a high stability and accuracy. The unit includes an OCXO (Oven Controlled Crystal Oscillator) which is phase-locked to 1PPS from GPS or other external input. All outputs are derived from the OCXO signal maintaining accurate time and frequency even when GPS reception is unavailable. The unit offer time accuracy of  $\leq 100$ ns RMS and Frequency accuracy better than 1E-11.

The **AR75A** provides 10MHz sine output and multiple timing outputs such as 1PPS (TTL, RS422, ICD-GPS-060) and TOD (NTP, Have Quick - ICD-GPS-060).

The unit has also TOD (Have Quick - ICD-GPS-060) and 1PPS inputs in order to synchronize the unit from external clock reference when GPS reception is not available.

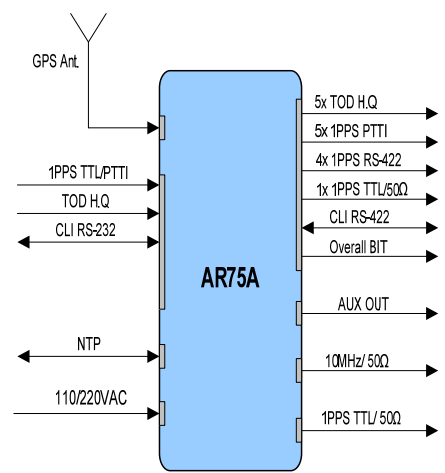
### Applications

- ❖ Network Synchronization
- ❖ Field calibration
- ❖ Range Timing
- ❖ Central timing systems
- ❖ Test and measurement
- ❖ Communication, Satellite and Ground Based Instrumentation
- ❖ Power industry

## SPECIFICATIONS

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

Input & Outputs	
<b>Outputs</b>	1 x 10MHz, Sine wave (8±3) dBm, BNC 2 X 1PPS TTL/50Ω (1 x BNC, 1 x D-TYPE) 5 x 1PPS ICD-GPS-060/ 50Ω, D-TYPE 4 x 1PPS RS-422, D-TYPE AUX: 1MHz or other signal (opt.), BNC 5 X TOD ICD-GPS-060 / 100KΩ, (1 x BNC, 4 x D-TYPE)
<b>Input</b>	TOD ICD-GPS-060 TTL/100K Ω, BNC GPS Antenna , TNC External 1PPS TTL/50Ω, BNC
<b>Communication</b>	CLI RS232 (Rx & Tx) for control and monitoring: setting time/date, delay correction for 1PPS 10ns steps, mode of operation; disciplining to GPS/Ext 1PPS, holdover, UTC time, GPS Time, Local Time, Day Light Saving etc....(see CLI document for more information). Baud rate: 19,200, Control: 1, N, 8 CLI RS422 (the Input (Rx) can not be connected simultaneously with the RS232). LAN – NTP GUI for PC is available as an option :Time, Date, Position, Status, BIT (Built in test) etc.



Performance - Disciplined to GPS or to Ext. 1PPS				
<b>Time (1PPS)</b>	<b>Accuracy</b>	≤100ns RMS @ 25°C, relative to an external ref.		
<b>Frequency (10MHz)</b>	<b>Long Term Stability</b>	< 1E-11 (24 hour average, const temp.)		
	<b>Short Term Stability (ADEV)</b>	≤ 4E-11 @ 1s		
	<b>Temperature Stability</b>	±1E-8 over -5°C to +50°C		
	<b>Phase Noise</b>	Frequency	Standard (spec)	Standard (typical)
		10Hz	≤-100dBc/Hz	≤-101dBc/Hz
		100Hz	≤-134dBc/Hz	≤-137dBc/Hz
		1KHz	≤-143dBc/Hz	≤-144dBc/Hz
10KHz	≤-145dBc/Hz	≤-149dBc/Hz		
<b>Harmonics</b>	≤-45 dBc			
<b>Spurious</b>	<-75 dBc @ ± 100KHz from carrier			
<b>Warm-up</b>	60 min for ≤2E-10			

Performance - Holdover (GPS or External input are not available)		
<b>Time (1PPS)</b>	<b>Drift</b>	≤ 1ms /24 hours
<b>Frequency (10MHz)</b>		< 1E-9 /24 hours

## SPECIFICATIONS *(continue)*

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### Power Supply

<b>Input Voltage</b>	110 / 220VAC.
<b>Power</b>	<8 Watt @ 25°C (steady-state)

### Industrial GPS Receiver

<b>Tracking</b>	L1 frequency (1575 MHz), C/A code 12 parallel tracking channels
<b>Position</b>	Lat., long., alt.
<b>Position Accuracy</b>	6m CEP (50%) w/o SA
<b>GPS Antenna DC Voltage</b>	5V
<b>Acquisition Time</b>	Warm start 45 second, Cold start < 50 second (worst case)

### Dimensions & Weight

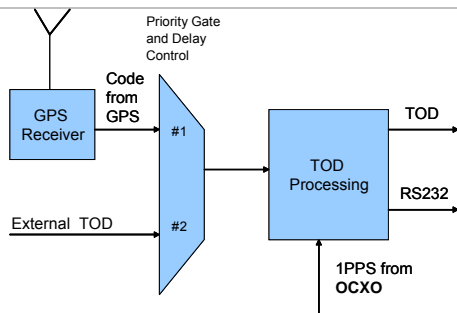
<b>Dimensions</b>	19", 1U – See Mechanical ICD below. 43.7 (high) x 347 (depth) x 483 mm (width)
<b>weight</b>	< 4 kg

### Reliability, Maintainability, Testability

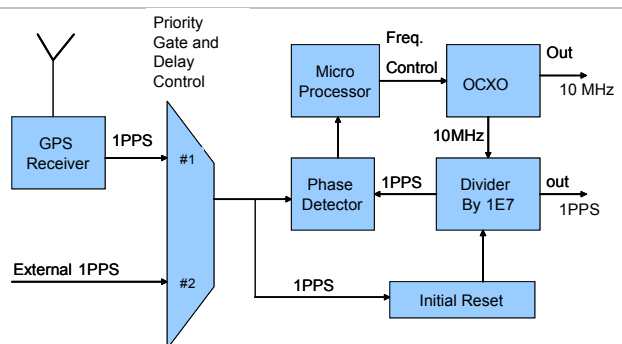
<b>BIT (Built In Test)</b>	On-line BIT – Automatic, Covers 90% of all failures
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### Principles of Operation

The following block diagrams depict the operation of the AR75A. The unit includes OCXO and accepts Input from internal GPS receiver, external 1PPS or external TOD (H.Q). All outputs are derived from the internal OCXO Clock, which is phase locked by a digital PLL to the selected input. Thus, the OCXO follows the GPS on average. If GPS reception is lost for short or long periods of time the OCXO continues to maintain accurate time and frequency without phase interruption.

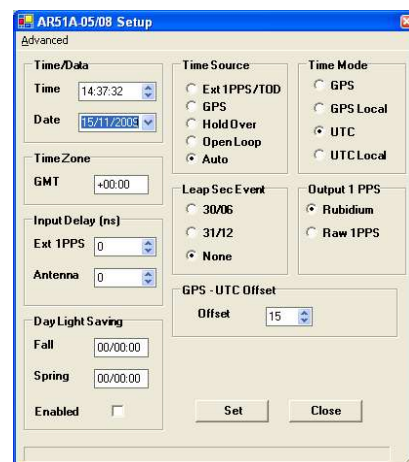
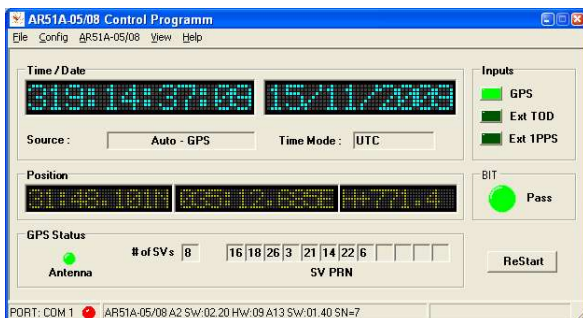


Data flow & Inputs Selection



OCXO-GPS D-PLL and Inputs

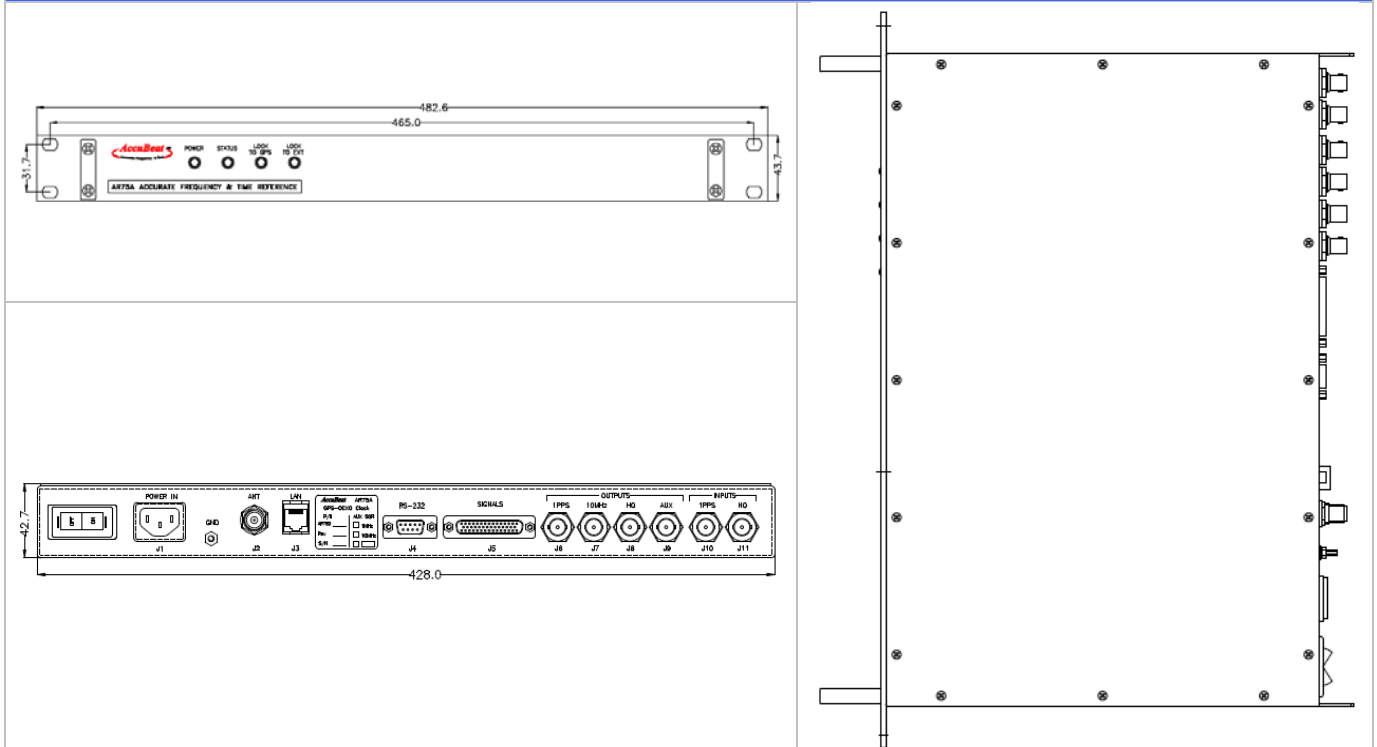
### Graphic User Interface (GUI) Software for PC (Opt.)



## SPECIFICATIONS *(continue)*

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### Mechanical ICD



## HOW TO ORDER

OPTIONS		AccuBeat P/N	Note
Number	Description		
00	GPS Discipline OCXO, 110/220VAC.	AR75A-00	

ACCESSORIES	AccuBeat P/N:
GPS Antenna 35 dB	EM30039
Antenna Cable RG-142 5m	AC50526
Antenna Cable RG-142 16m	AC50526-01
Antenna Cable RG-213 16m	AC50547
Antenna Cable LMR400 40m	AC50542
GUI Software for PC for Remote Control	SW50010

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