



# GPS Time Transfer Receiver

## Model: AQTIME VP-200T

**GPS time transfer receiver with precise (+/- 1 micro second) 1pps timing output/ Rising edge synchronized to UTC for system timing synchronization**



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### Introduction:

The AQTIME VP-200T is the integration of a timing GPS receiver and antenna in a compact/weatherproof enclosure for time-transfer application. It outputs UTC synchronized 1pps pulse with +/- 100 nanoseconds tolerance close to an atomic clock in accuracy. It fits virtually any GPS Time and Frequency application that requires precise time signal outputs. The large number of multiple output signals, ease of operation, automatic turn-on mode requiring no operation intervention and its large number of optional features provide the most cost-effective solution available in the industry. At the premise of a previously acquired first fix data, the AQTIME VP-200T is capable of maintaining precise time and frequency reference even under very harsh environment with only inferior satellite locks available!

### Features:

- All-in-one construction, ultra compact, fully weatherproof, easy to mount
- Easy operation & high affordability

- Uninterrupted parallel 12-channel tracking & data calculation of up to 8 GPS satellites for accuracy
- Flexible antenna matching circuit
- Wide operating temperature range
- Rapid acquisition - 20 seconds warm start typically
- Easy acquisition - time data available even with only three inferior satellites tracked
- High accuracy of UTC +/-100 nanoseconds via software adjustment
- Precision leap second adjustment performed automatically
- Flexible power supply (8~40VDC) & low power consumption (1.1W typically)
- RS-232 (working range: 50m) or optional RS-422 (working range up to 600m) Input / Output Port

### Applications:

- Master clock reference system for test and measurement requirements
- Metrology lab frequency monitor or frequency reference system
- Range instrumentation systems
- Telecommunications time & frequency primary clock reference system
- Military and banking communications networks - special timing requirements for synchronization of data encryption and decryption equipment
- Astronomic observatories - timing records of celestial events and simultaneous observations at distant locations.
- Earthquake monitoring, mineral research, and general navigation
- Synchronization of radio base stations for cellular phones, pagers, etc.
- Time control of computer network terminals
- AQTIME VP-200T SPECIFICATIONS

### Specifications:

PHYSICAL		PERFORMANCE	
Dimension:	4.5" diameter x 2.9" (H) or 11.4cm x 7.4cm(H)	Antenna:	High-reliability ceramic patch
Weight:	0.8lb(360g) without cable	Antenna LNA gain:	26+/-2dB, NF: 2.0dB max
Enclosure:	Highly impact, corrosion-proof PC (polycarbonate) resin	Receiving Frequency:	1575.42MHz, C/A code
Construction:	Hermetically sealed & fully waterproof	Receiver Architecture:	12 channel ail-in-view algorithm tracks & uses up to 12 satellites
Mounting:	Pole mount to 1"-14 threaded pipe	DGPS Capability:	Direct RTCM-SC104 interface
ENVIRONMENTAL		Acquisition Time:	20 sec. typical (warm start)
Temperature:	Operating -30~+75°C,	Position Accuracy:	15m or 50 feet RMS*

	storage -40~+85°C		
Humidity:	95% non-condensing	Velocity Accuracy:	0.1 knots RMS steady-state
<b>POWER</b>		Update Rate:	1 sec. continuous
Input Power:	DC 8~40V, with reverse protection	Dynamics:	Up to 49m/s.s (tracking sustained)
Voltage Regulator:	on-board, switching mode	1 PPS Timing Output:	Generates one pulse per second with rising edge synchronized to UTC after having a position fix
Consumption:	1.1Watt, typical	1 PPS Timing Accuracy:	1 μ sec. typical/ 100ns after calibration
EMI Filter:	rejects power line interference	* Subject to degradation of position to 100m 2DRMS under US DoD Selective Availability program	
<b>COMMUNICATION</b>		<b>INTERFACE</b>	
Protocol:	NMEA 0183, 4800 baud rate	Output protocol:	NMEA 0183/ RS-232 or RS-422
Signal Level:	RS232 or RS422 (optional)	Standard Output Sentences:	GLL: Position & UTC time GGA: Position & UTC time RMC: Position, time, speed, course ZDA: Time & Date
1 PPS	TTL	Custom Outputs:	Refer to OEM options
<b>DATA CABLE</b>		San Jose Technology, Inc. may add other NMEA sentences to the standard output to maximize interfacing capabilities.	
Length:	15m (standard RS232) 100m (optional RS422)		
Description:	Multi-color conductors strained in a shielded/ weatherproof jacket	<b>I/O PIN ASSIGNMENT</b>	
<b>I/O CONNECTOR</b>		Connector	Wire
Housing:	7 pin circular, hermetically sealed	PIN1	White
Pins:	Gold plated for anti-corrosion	PIN2	Green
<b>OEM OPTIONS</b>		PIN3	Yellow
Output Interval:	0~60 sec. selectable	PIN4	Bare Braid
Operating Mode:	2D, or 2D/3D automatic	PIN5	Blue
Type of Interface:	RS 232 or RS 422 (optional)	PIN6	Black
Datum:	One of the 171 datum supported	PIN7	Red
Extended Input Voltage:	Up to DC 60V		
Sentence Available:	GGA, ZDA, RMC, GLL, GSA, GSV, VTG		
Satellite Mask:	SNR, PDOP, elevation angle , satellite number		

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1 PPS OUTPUT (Rising edge traceable to UTC)	
Output Pin:	Pin#5 (Blue)
Max Output Current:	+/- 5.3 mA
Voltage High:	2.4V min @ -0.8mA
Voltage Low:	0.5V max @ 5.3mA
Start to Output:	Only when position fix is obtained
Synchronization:	Rising edge is synchronized to UTC.
Accuracy:	Within +/- 1 micro second typically
Duty Cycle:	50%
Adjustment:	100ns increment (advance or delay)
Adjustment Command:	\$PFEC, Gpset, Txnnnn CR LF x= - to advance 1pps pulse / x= + to delay 1pps pulse nnnn= 0000~9999
Example:	\$PFEC, Gpset, T-0006 =>1pps pulse will be advanced by 600 nanoseconds \$PFEC, Gpset, T+0050 =>1pps pulse will be delayed by 5 microseconds

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