

# Xenith TBR GPS Disciplined Clock

## General Description

In a world where good timing is critical, the Xenith TBR is the ultimate partner for your DAB, wireless communications, time-stamping or any other timing vital application.

The Xenith TBR module is a GPS driven, mixed-signal phase lock loop, providing a 1PPS CMOS output and generating a 10MHz SINE output from an intrinsically low jitter voltage controlled crystal oscillator. The 10MHz output is disciplined from an on-board GPS receiver, which drives the long term frequency stability. The on board GPS receiver at the core of the Xenith TBR is the highly successful and well established CW25 timing receiver. This GPS engine along with a dual oven system provides the highest quality timing and synchronization signals combined with superb holdover characteristics.

The unit is housed in a 106x125x56mm stylishly designed, strong aluminum enclosure. The 10MHz and 1PPS signal are available on BNC connectors. The antenna input is also a BNC connector and will operate a 5V active antenna. The Xenith TBR requires this antenna to be placed outdoors for best stability and consistent performance. The Xenith TBR communicates via RS232 and can be operated and monitored through NMEA or TSIP protocol. The user can observe the status of the unit, time of day, position and satellite quality information via either of the two protocols. The unit has a wide DC power input range, between 8 and 28VDC, via a secure 2 pin Molex type connector. Accessories such as: AC Mains adaptor (all regions), antenna cable, high performance outdoor antenna and serial cable are available as a kit or can be individually purchased as needed.

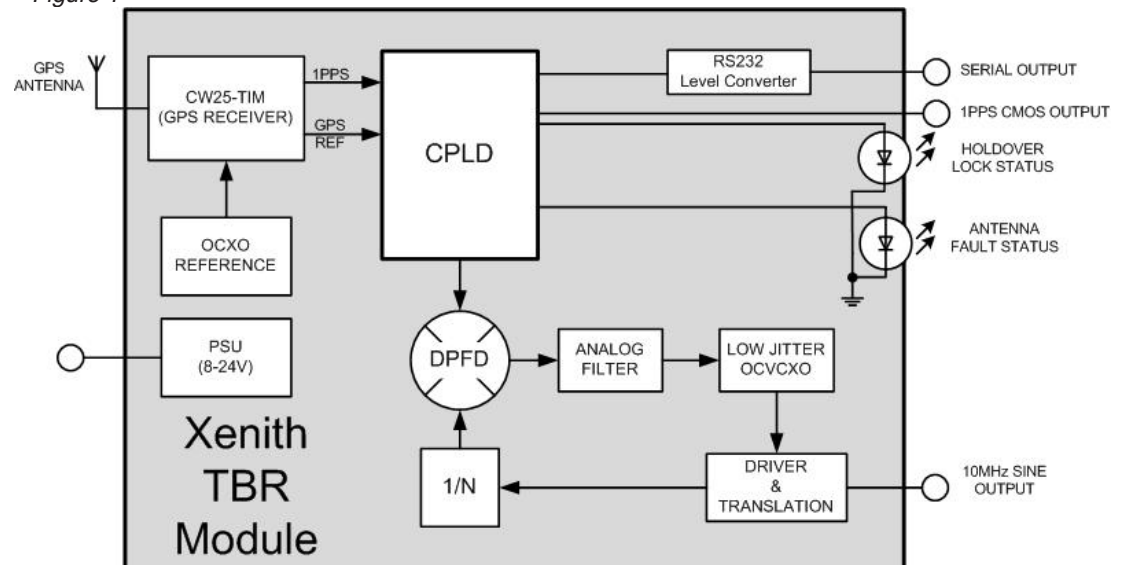


## Features

- Stratum 1 Time Source
- G.811 Compliant (GPS Locked)
- Meets ESTI PRC Wander Generation Mask(GPS Locked)
- Phase locked 10.0 MHz output
- Low Phase Noise
- Precise 1 PPS output
- Serial input/output port (GPS receiver)
- Master reset
- 8V-28V Power Supply
- Commercial Temp (0-70° C)
- Mechanical Dimensions  
106 x 125 x 56mm  
(not including connectors)
- Aluminum Housing
- Fixed Position Unit

## Functional Block Diagram

Figure 1



Bulletin	NS42
Revision	A02
Date	17 Nov 2010

## Operating Specifications

Parameter	Minimum	Typical	Maximum	Units	Notes
Mechanical Dimensions		106 x 125 x 56		mm	
Main supply voltage	8	24	28	Vdc	
Operating Temperature	0		70	°C	
Power Consumption (initial Power up)	-	11.3	12	Watts	
Power Consumption (Continuous mode)	-	4.41	5	Watts	
<b>GPS</b>					
Voltage for Active Antenna (Vdc)	4.8	5.0	5.1	V	
Current Draw for Antenna	-	45		mA	
GPS Channels	-	12	-		
Tracking sensitivity	-	156	-	dBm	
Acquisition sensitivity	-	155	-	dBm	
GPS Acquisition Time		150		sec	
Update rate		1		Hz	
<b>I/O Communications</b>					
Protocol		NMEA 0183, TSIP			
Electrical		RS232			
<b>Timing Signals -1PPS CMOS</b>					
Pulse Amplitude		3.3		Vdc	
Pulse Width		100		uS	
Accuracy (RMS)		30		nS	
<b>Timing Signals -10Mhz Sine wave</b>					
Impedance		50		Ohm	
Power		9		dBm	
Total Harmonic Distortion		2.2%			
Compliant Specifications	G.811 Compliant (GPS Locked) G.812 Holdover Compliant ESTI PRC Wander Mask(GPS Locked)				

## Absolute Maximum Rating

Parameter	Minimum	Maximum	Units	Notes
Input DC Voltage	-0.3	30.5	V	1
Operating Temperature	-30	80	°C	1

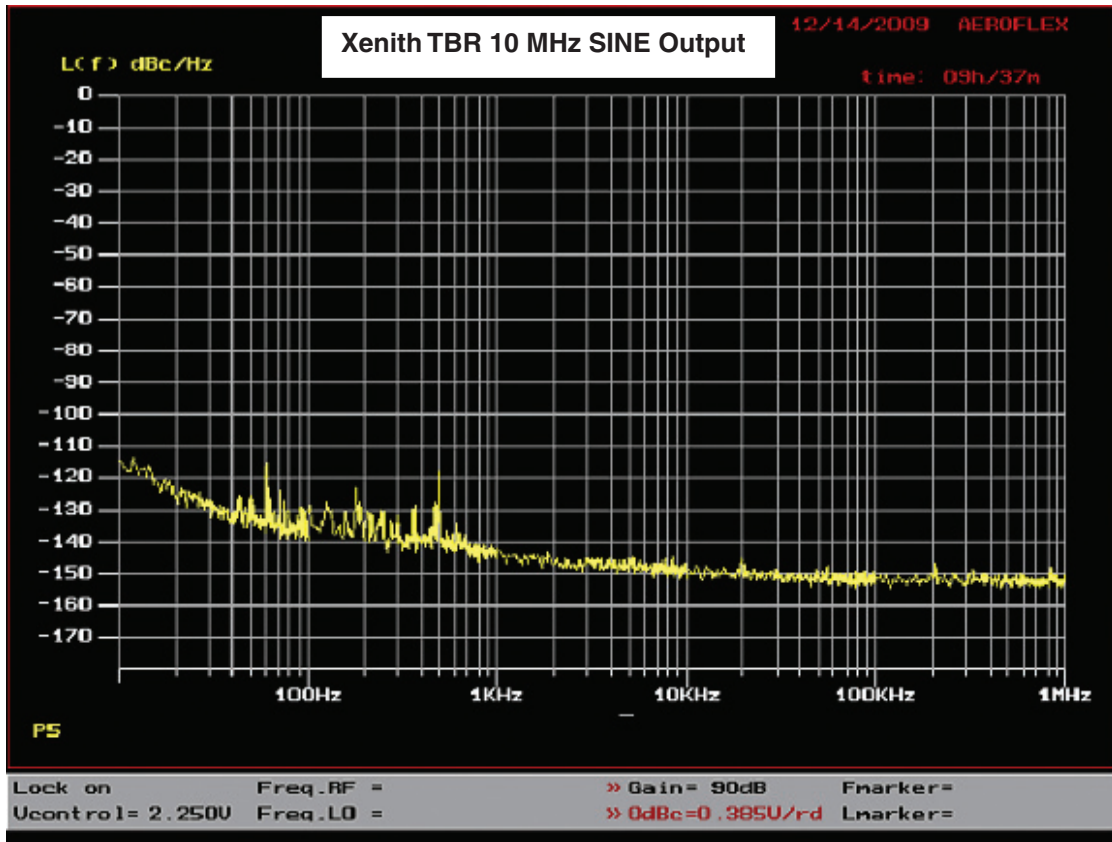
**NOTES:**

1. Stresses beyond those listed under "Absolute Maximum Rating" may cause permanent damage to the module. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "Operating Specifications" is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

## Phase Noise

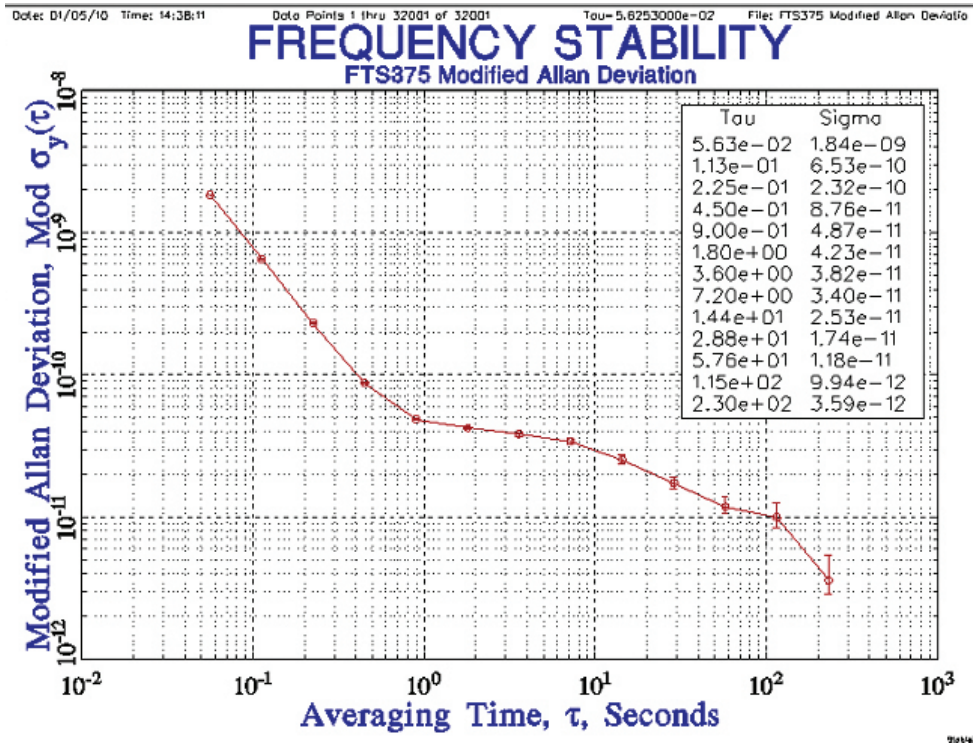
Figure 2

Phase Noise:	
Offset Frequency (Hz)	Typical (dBc / Hz)
10	-115
100	-135
1k	-143
10k	-148
100k	-152
1M	-153



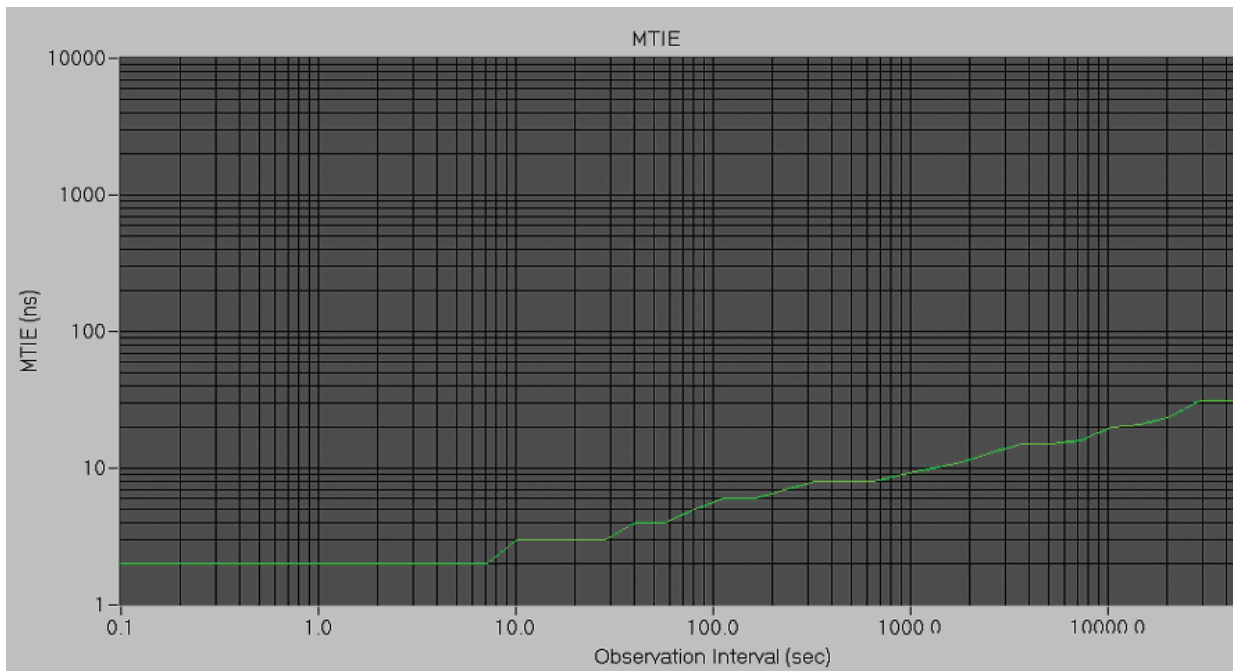
## Xenith TBR Modified Allan Deviation

Figure 3



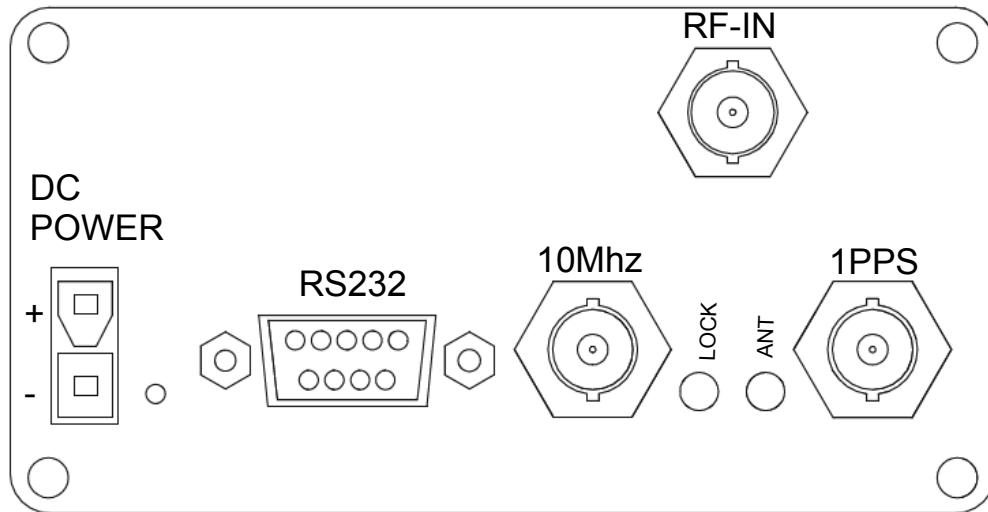
## Xenith TBR Wander Generation Plot

Figure 4



## Xenith TBR Front Panel

Figure 5



### TBR Connector Information

Connector	Name	Description
BNC:	RF-IN 10Mhz 1PPS	Antenna Input, Provides 5vdc for Active antenna (Max current draw 45mA) High performance 10Mhz reference signal High accuracy 1 Pulse per Second signal
DB9-F	RS232	ASCII/NMEA or TSIP for monitoring and configuration
Molex	Power	8-28vdc Input, mates with 2-Way Mini-Fit Jr Molex connector, Mating PN: 39-01-3022

### Purchasing Information:

Part Number	Description
93.006101	Xenith TBR Module [NMEA]
93.006103	Xenith TBR [NMEA] Starter Kit
	Includes: High Performance Outdoor Cone Antenna Antenna Mounting Bracket 20M Antenna RG58 Cable DB9 Serial Cable AC Mains Adaptor all-regions 15V, 18W, 2.1mm barrel plug Power Adaptor cable, 2.1mm to Molex connector Xenith TBR Module (NMEA)
93.006105	Xenith TBR Module [TSIP]
93.006107	Xenith TBR [TSIP] Starter Kit, Same accessories included as NMEA version

**Each of the Kit accessories can also be bought separately using the following information:**

Part Number	Description
93.106101	High Performance Outdoor Cone Antenna
93.106102	20M Antenna RG58 Cable
93.106103	DB9 Serial Cable
93.106104	AC Mains Adaptor all-regions 15V, 18W, 2.1mm barrel plug
93.106105	Power Adaptor cable, 2.1mm to Molex connector
93.106106	Antenna Mounting bracket, wall and pole (diameter <2inches) mount

**A Mounting bracket for Xenith TBR module is also available:**

Part Number	Description
93.106107	19 inch mounting bracket adaptor for Xenith TBR Module

## **Xenith TBR** **GPS Disciplined Clock**



*Time Base Reference GPS Disciplined Clock*

<b>Revision</b>	<b>Revision Date</b>	<b>Note</b>
A00	09/07/10	Advanced Release
A01	10/04/10	Updated Connector Information & Ordering Information
A02	11/17/10	Features Updates

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