



# TIM-4P

## Programmable GPS Receiver Module ANTARIS® 4 Positioning Engine

Preliminary Data

### Overview

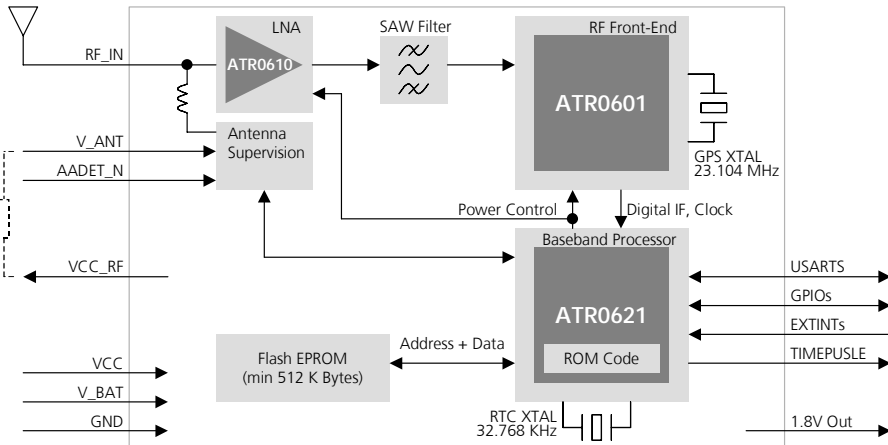
The TIM-4P is a programmable GPS module containing the new u-blox 16-channel ANTARIS 4 receiver technology that provides high receiver performance at low power consumption. The ANTARIS 4 GPS engine offers excellent navigation performance in the most challenging metropolitan areas.



25.4 x 25.4 x 3 mm

It is a suitable successor to the existing ANTARIS modules like the TIM-LP, the TIM-LF and the TIM-LL, with which it also shares the 25.4 x 25.4 x 3 mm industry standard form factor initially created by u-blox. Its 35% reduced power consumption means extended battery time for portable, handheld consumer devices. Finally, its small form factor and SMT pads are designed for fully automatic assembly processes with standard pick-and-place equipment and reflow soldering, enabling cost-efficient, high-volume production.

### Block Diagram



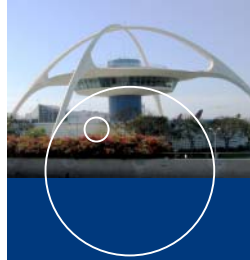
### New with ANTARIS 4

- 35 mA supply current (Power reduction by more than 35% compared to predecessor modules)
- Significantly lower battery backup current
- RoHS compliant (lead-free)

### Key Features

- 16 channel ANTARIS 4 positioning engine
- 4 Hz position update rate
- Assisted GPS (MS-Assisted, MS-Based)
- DGPS and full SBAS (WAAS, EGNOS) support
- FixNOW™ power saving mode
- Supports passive and active antennas
- Antenna short and open circuit detection and protection
- Operating temperature range: -40 to 85°C

*your position  
is our focus*



## Receiver Performance Data

<b>Receiver Type</b>	16 channel, L1 frequency, C/A code	
<b>Max. Update Rate</b>	4 Hz	
<b>Accuracy</b>	Position	2.5 m CEP
	DGPS / SBAS	2.0 m CEP <sup>1</sup>
<b>Start-up Times</b>	Hot start	<3.5 sec
	Warm start	33 sec
	Cold start	34 sec
	Aided start	5 sec
	Reacquisition	< 1 s
<b>Sensitivity</b>	Acquisition	-140 dBm
	Tracking	-150 dBm
<b>Timing Accuracy</b>	RMS	50 ns
	99%	<100 ns
<b>Operational Limits</b>	Altitude	18,000 m
	Velocity	515 m/s
	One of the limits may be exceeded but not both.	

<sup>1</sup> Depends on accuracy of correction data provided by the DGPS or SBAS service

## Interfaces

<b>Serial Ports</b>	2 UARTs	
<b>Digital I/O</b>	Configurable time pulse 2 EXTINTs inputs for time mark / counter (optional)	
<b>Serial and I/O Voltages</b>	3 V levels, 5 V tolerant inputs	
<b>Protocols</b>	NMEA, UBX binary, RTCM  Supports protocol mixing over same serial port	

## Electrical Data

<b>Power Supply</b>	2.7 – 3.3 V	
<b>Power Consumption</b>	typ. 36 mA @ 3.0 V	
	typ. 35 mA @ 2.7 V	
	Sleep mode: typ. 80 µA	
<b>Backup Power</b>	1.5 V – 3.6 V, typ. 5 µA	
<b>Antenna Power</b>	External or Internal VCC_RF	
<b>Antenna Supervision</b>	Integrated short-circuit detection and antenna shutdown, open circuit detection is supported with AADET_N input and little external circuitry	

## Available Programming Resources<sup>2</sup>

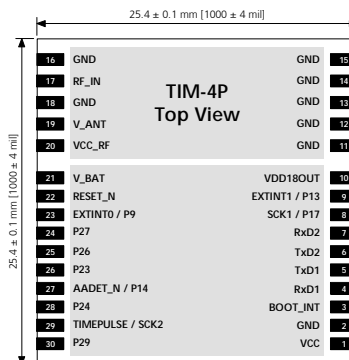
<b>Processor</b>	ARM7 @ 23MHz 3.75 – 9 MIPS <sup>3</sup> @ 1Hz Navigation update	
<b>Memory</b>	FLASH	Min. 512 K Bytes
	SRAM	8 K Bytes
<b>Serial Interfaces</b>	2 UARTs Async. and Sync.	
<b>Digital I/O</b>	9 GPIOs (2 are interrupt capable)	

<sup>2</sup> ANTARIS 4 SCKit is required. Please contact u-blox.  
<sup>3</sup> "VAX MIPS" Dhystone, vacant CPU capacity for user code

## Environmental Data

<b>Operating Temp.</b>	-40°C to 85°C
<b>Storage Temp.</b>	-40°C to 125°C
<b>Vibration</b>	5 Hz to 500 Hz, 5g (IEC 68-2-6)
<b>Shock</b>	Half sine 30g / 11ms (DIN 40046-7)

## Mechanical Data



## Support Products

<b>AEK-4P</b>	An easy-to-use kit to get familiarized with the ANTARIS 4 positioning technology, to evaluate functionality and to visualize GPS performance.
<b>ANTARIS 4 GPS Evaluation Kit</b>	
<b>ANTARIS 4 Software Customization Kit</b>	Software Customization Kit for creating own software on TIM-4P. Planned for 1Q 2006

## Ordering Information

<b>TIM-4P-0-000-0</b>	TIM-4P – Programmable GPS Receiver Module
	<b>Delivery Packing</b>
	0 = Single samples
	1 = Tape on reel (100 pieces)

Parts of this product are patent protected.

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