



## COPERNICUS II GPS RECEIVER

### KEY FEATURES

- 2.54 mm T x 19 mm W x 19 mm L
- -160 dBm tracking sensitivity
- 132 mW typical continuous tracking
- Fast TTFF (cold start): 38 sec
- Supports SBAS (WAAS, EGNOS, MSAS)
- Active or passive antennas
- NMEA, TSIP, TAIP protocols
- RoHS-Compliant (Pb-free)
- 2G dynamics
- Stable indoor PPS in Stationary Mode



### ULTRA-THIN, LOW POWER, SURFACE MOUNT GPS MODULE

#### Drop-in Performance

The Trimble® Copernicus® II GPS receiver delivers proven performance and Trimble quality for a new generation of position-enabled products. It features the TrimCore™ navigation software for extremely fast startup times and high performance in foliage canopy and urban canyon environments.

The Copernicus II is compatible with all applications using the previous generation of Copernicus module\*. The Copernicus II module is a complete 12-channel GPS receiver in a 19 mm x 19 mm x 2.54 mm thumbnail-sized module. The module is packaged in tape and reel for high speed pick-and-place manufacturing processes; 28 edge castellations provide RF and I/O interface without the need for connectors. Each module is manufactured and tested to Trimble's highest quality standards.

The sensitive Copernicus II GPS receiver can autonomously acquire GPS satellite signals and quickly generate reliable position fixes in extremely challenging environments and under poor signal conditions. The unit also accepts aided GPS (A-GPS) data for faster startups in very weak conditions.

In Stationary Mode the Copernicus II GPS receiver can produce an accurate and stable PPS with an indoor antenna

Features include:

- Self survey
- TRAIM on clock and frequency
- Noise filter to reduce PPS variance

The Copernicus II GPS module is a complete drop-in, ready-to-go receiver that provides position, velocity, and time data in a user's choice of three protocols. Trimble's powerful TSIP protocol offers complete control over receiver operation and provides detailed satellite information. The TAIP protocol is an easy-to-use ASCII protocol designed specifically for track and trace applications. The bi-directional NMEA 0183 v3.0 protocol offers industry-standard data messages and a command set for easy interface to mapping software.

#### Applications

Compatible with active or passive antennas, the Copernicus II GPS receiver is perfect for portable hand-held, battery-powered applications. The receiver's small size and low power requirement make it ideal for use in portable appliances, sport accessories, personal navigators, cameras, computer, and communication peripherals, as well as vehicle tracking, navigation, and security applications.

# COPERNICUS II GPS RECEIVER

## PERFORMANCE SPECIFICATIONS

Accuracy (24 hr static)  
 Horizontal. . . . . <2.5 m 50%, <5 m 90%  
 SBAS . . . . . <2.0 m 50%, <4 m 90%  
 Altitude. . . . . <5 m 50%, <8 m 90%  
 SBAS . . . . . <3 m 50%, <5 m 90%  
 Velocity . . . . . 0.06 m/sec  
 Static PPs. . . . . ±60ns RMS  
 PPS (Stationary Mode "indoor" @ -145dBm) . . . . . ±350ns

Acquisition (Autonomous, -130dBm, 50%)  
 Reacquisition . . . . . 2 s  
 Hot Start. . . . . 3 s  
 Hot Start without battery backup . . . . . 8 s\*  
 Warm Start . . . . . 35 s  
 Cold Start . . . . . 38 s

Sensitivity (unaided)  
 Tracking . . . . . -160 dBm  
 Acquisition . . . . . -148\*\* dBm

Receiver Dynamics . . . . . 2G

\* Ephemeris not older than 4 hours.  
 \*\*For hot start with ephemeris otherwise -144 dBm

## INTERFACE CHARACTERISTICS

Connections . . . . . 28 surface-mount edge castellations  
 Serial Port. . . . . 2 serial ports  
 PPS. . . . . 3.0 V CMOS-compatible pulse, once per second  
 Protocols. . . . . TSIP, TAIP, NMEA 0183 v3.0  
 Bi-directional NMEA messages  
 Messages selectable by NMEA commands  
 Selection stored in flash memory

## ELECTRICAL CHARACTERISTICS

Prime Power . . . . . +2.7 V DC to 3.3 V DC  
 Power Consumption . . . . . (typ.) 44 mA (132 mW) @ 3.0 V  
 Backup Power. . . . . +2.7 V DC to +3.3 V DC  
 Ripple Noise . . . . . Max 50 mV, peak-to-peak from 1 Hz to 1 MHz

## ENVIRONMENTAL SPECIFICATIONS

Operating Temperature. . . . . -40 °C to +85 °C  
 Storage Temperature. . . . . -55 °C to +105 °C  
 Vibration . . . . . 0.008 g2/Hz. . . . . 5 Hz to 20 Hz  
 . . . . . 0.05 g2/Hz. . . . . 20 Hz to 100 Hz  
 . . . . . -3 dB/octave . . . . . 100 Hz to 900 Hz  
 Operating Humidity. . . . . 5% to 95% R.H. non-condensing, at +60 °C

## PHYSICAL CHARACTERISTICS

Enclosure. . . . . Metal shield  
 Dimensions . . . . . 19 mm W x 19 mm L x 2.54 mm H  
 (0.75 in W x 0.75 in L x 0.1 in H)  
 Weight . . . . . <2 g (0.07 oz) including shield

## PINOUT ASSIGNMENTS

GND	1		28	GND
GND	2		27	GND
RF-IN	3		26	Reserved
GND	4		25	Reserved
LNA	5		24	TXD-B
VBAT	6		23	TXD-A
Open	7		22	Reserved
Short	8		21	RXD-A
Reserved	9		20	RXD-B
Reserved	10		19	PPS
Xreset	11		18	Reserved
Vcc	12		17	Reserved
GND	13		16	Xstandby
GND	14		15	GND

## ORDERING INFORMATION & ACCESSORIES

**Module** . . . . . available as 20 piece module package for evaluation  
 Tape on reel (100 pieces)  
 Tape on reel (500 pieces)

**Reference Board** . . . . . Copernicus II GPS module mounted on a carrier board with I/O and RF connectors, including the RF circuitry with the antenna open detection, as well as antenna short detection and protection.

**Starter Kit** . . . . . Includes Copernicus II Reference Board mounted on interface motherboard in a durable metal enclosure, 3 additional Copernicus II modules (63530-00), AC/DC power converter, compact 3V magnetic-mount GPS antenna with MCX connector and 5m cable. Also comes with USB interface cable, cigarette lighter adapter, TSIP, NMEA, and TAIP protocols. Software Tool Kit is available from the Trimble Support page.

FEATURE DIFFERENCE TABLE	63530-00	63530-10	67415-00
Standby Serial Command Supported	No	Yes	No
SHORT pin can be pulled HIGH when not used	Yes	Yes	No (SHORT must be "no connect" if not used)

PRODUCT	PART NUMBER	MOQ PACKAGING OPTIONS
Copernicus II	63530-00	20 piece tray, 100 or 500 piece reels
Copernicus II with Soft Shutdown feature supported	63530-10	20 piece tray, 100 or 500 piece reels
Copernicus IIA	67415-00	20 piece tray, 100 or 500 piece reels
Copernicus II reference board	63531-00	1 reference board
Copernicus II Starter Kit	63532-05	1 starter kit
3V Magnetic Mount Antenna, MCX	66800-50	20, 80 or 400 antennas
3V Magnetic Mount Antenna, SMA	66800-52	20, 80 or 400 antennas

Parts of this product are patent protected.

Trimble has relied on representations made by its suppliers in certifying this product as RoHS compliant.

Specifications subject to change without notice.

Trimble Navigation Limited is not responsible for the operation or failure of operation of GPS satellites or the availability of GPS satellite signals.

\*63530-10 version

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