

Step Global Timing Solutions



The primary source of accurate time is GNSS satellites. Each satellite has its own atomic clock that is synchronised with a master earth station.. At Step Global we have a wide portfolio of timing products from international brands like American Time, Time Tools, Trimble, Protempis and SpaceOn. These products include Time displays, Atomic clocks, Timing Receivers, Timing Antennas, NTP servers and Digital/Analog Clocks

GNSS Receivers

TRIMBLE HIGH-PRECISION MAXWELL™ 7 L1, L2, L5, E6 MODULES



Trimble BD992-INS

The BD992-INS is a dual-antenna receiver with an integrated inertial navigation system, That supports position and orientation at high update rates.



Trimble BD992

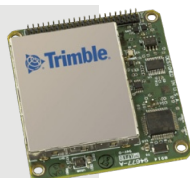
The Trimble BD992 dual-antenna, single board solution for precise position and heading.



Trimble BD990

The BD990 is a triple-frequency receiver for all GNSS constellations.

TRIMBLE HIGH-PRECISION MAXWELL™ 7 L1, L2, L5 MODULES



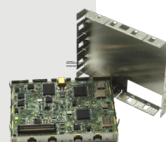
Trimble BD940-INS

The BD940-INS is a triple-frequency, multi-constellation, reduced size GNSS/INS solution. Compact size and centimeter-level accuracy supports mobile, robotic, and airborne applications.



Trimble BD920

The BD9250 is a dual-frequency L1/L2 or L5 field-switchable GNSS receiver with integrated MSS-Band to support Trimble RTX service.



Trimble BD940

The BD940 is a triple-frequency, high-precision GNSS receiver that is very compact to allow for integration into tight spaces.



Trimble BD920S

The BD9250s is a dual-frequency L1/L2 or L5 field-switchable GNSS receiver with integrated S-Band frequency to support the Indian Regional Navigation Satellite System, NavIC.T

TRIMBLE HIGH-PRECISION MAXWELL™ 7 Rugged Enclosed Receivers



Trimble BX940

The BX940 receiver enclosure is an integrated GNSS-Inertial engine delivering high accuracy GNSS, DGNS positions in the most challenging enviroments powered by the BD940-INS.



Trimble BX992

The BX992 is a dual-antenna receiver enclosure with integrated inertial navigation system powered by the BD992-INS.

GNSS Smart Antennas

TRIMBLE SMART ANTENNAS



Trimble AX940i

A compact and easy-to-install high-precision GNSS smart antenna with an integrated receiver contained within a sleek enclosure, built-in inertial sensors and WiFi and Bluetooth



Trimble AX940

A compact and easy-to-install high-precision GNSS smart antenna with an integrated receiver contained within a sleek enclosure.

TRIMBLE HIGH PRECISION & RUGGED ANTENNAS



Trimble Zephyr 3 Base

With its integrated Stealth™ resistive ground plane at the top of the Zephyr range with maximum multipath mitigation, this is the antenna of choice not just for all RTK Reference Stations but also for Rover applications in highly reflective reception environments.



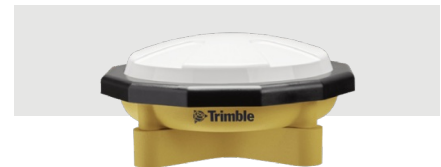
Trimble Zephyr 3 Rover

A high-performing lightweight GNSS rover antenna optimized for precision RTK and roving applications. The Zephyr Rover minimizes multipath and offers robust low elevation tracking and millimeter phase center repeatability.



Trimble GA830

The Trimble GA830 antenna is designed to support centimeter-level accuracy for rugged land and marine applications.



Trimble Zephyr 3 Rugged

Designed for applications in high shock and vibration environments like machine-control up to 75g shock and 20.4g RMS, the Zephyr Rugged is available in two versions with 5/8" mast mounting and with 3" mast clamp

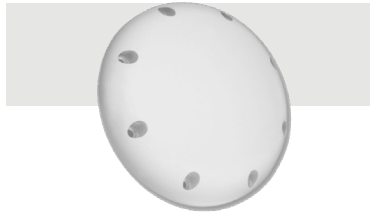


TRIMBLE VEHICLE MOUNT ANTENNAS



Trimble LV59

The LV59 is a highly robust antenna with an all-aluminum base for 5/8" thread mount, equipped with sub-centimeter phase center accuracy and superior signal tracking of current and near-future GNSS signals for land and marine applications.



Trimble AV59

The AV59 is a highly robust antenna with rugged 8-hole bulkhead mounting with rubber o-ring sealing for aerial, land, and marine applications. It offers sub-centimeter phase center accuracy and superior signal tracking of current and near-future GNSS signals.



Trimble LV59

The Trimble AG25 antennas are designed to support centimeter-level land platforms like agriculture and logistic vehicles.

TRIMBLE SMALL FORM FACTOR ANTENNAS



Trimble AV28

A precise triple-frequency, L-band antenna suitable for a wide range of applications where the weight and size really matter.



Trimble AV17

A helix based, triple-frequency L-band antenna ideal for UAV applications due to its lightweight, small form factor and low power consumption design.



Trimble AV16

A helix based, dual-frequency antenna ideal for UAV applications due to its lightweight, small form factor and low power consumption design.

HARXON GNSS SMART ANTENNAS



Smart Antenna TS112 PRO



- Multi Frequency, Multi-Constellation, Integrated Antenna Receiver
- Ultimate Positioning Accuracy
 - Comprehensive GNSS Support for Robust Positioning Performance
 - GLIDETM Positioning Technology
 - STEADYLINE® Smooth Positioning
 - Terrain Compensation for Maximum Accuracy
 - Rich Interfaces for Flexible Connectivity
 - Ruggedized and Durable Design, Flexible Installations Available

Smart Antenna TS112 PRO



- Multi-Constellation, Integrated Antenna Receiver
- Multi-Constellation for Advanced Secure Positioning
 - Multi-point feed-in design to achieve greater phase centre stability.
 - Bluetooth, built-in/external radio transmission modems
 - GPS, GLONASS, BeiDou, Galileo, for simultaneous satellite tracking to offer RTK positioning.

VEHICLE COMBINATION ANTENNAS



HX-AUST002

HX-AUST002 seamlessly integrates multi-constellation multi-band GNSS antenna, consistent V2X communication with uniform radiation element, plus embedding 4 units of 5G antennas. Customisable options as DSRC, C-V2X, UWB, AM/FM, WIFI dual-frequency.

HX-AULT006

HX-AULT006 offers comprehensive GNSS support and exhibits stable phase centre variation, extraordinary 4.5dBic (typical value) gain with ultralow signal loss, wide beam width and low elevation satellite tracking ability.

HX-AULT008

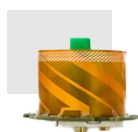
HX-AULT008 offers comprehensive GNSS support and exhibits stable phase center variation, extraordinary 4.5dBic (typical value) gain with ultralow signal loss, wide beam width and low elevation satellite tracking ability.

HX-AULT002

HX-AUST002 seamlessly integrates multi-constellation multi-band GNSS antenna, consistent V2X communication with uniform radiation element, plus embedding 4 units of 5G antennas. Customisable options as DSRC, C-V2X, UWB, AM/FM, WIFI dual-frequency.

COMPACT HELICAL GNSS ANTENNAS

The weight and size of traditional helix antennas make it difficult to integrate them with Unmanned Aerial Vehicle (UAV) systems. The complex environments and electromagnetic interference encountered by these UAVs put additional requirements on antennas used for their application. This is why Harxon has introduced a wide range of GNSS antennas specifically designed for unmanned aerial systems.



HX-CUX005A

Embedded
Helix GNSS
with integrated
WiFi & BT



HX-CU7603A

High performance GNSS
with L-Band
reception



HX-CH7609A

High Stability
GNSS with
strong interference rejection



HX-CHX600A

Rugged precision GNSS with
L-Band
reception



HX-CH7603A

High gain on low
elevation satellites
provides exceptional
signal.



HX-CH6601A

Small and light
GNSS with high
stability



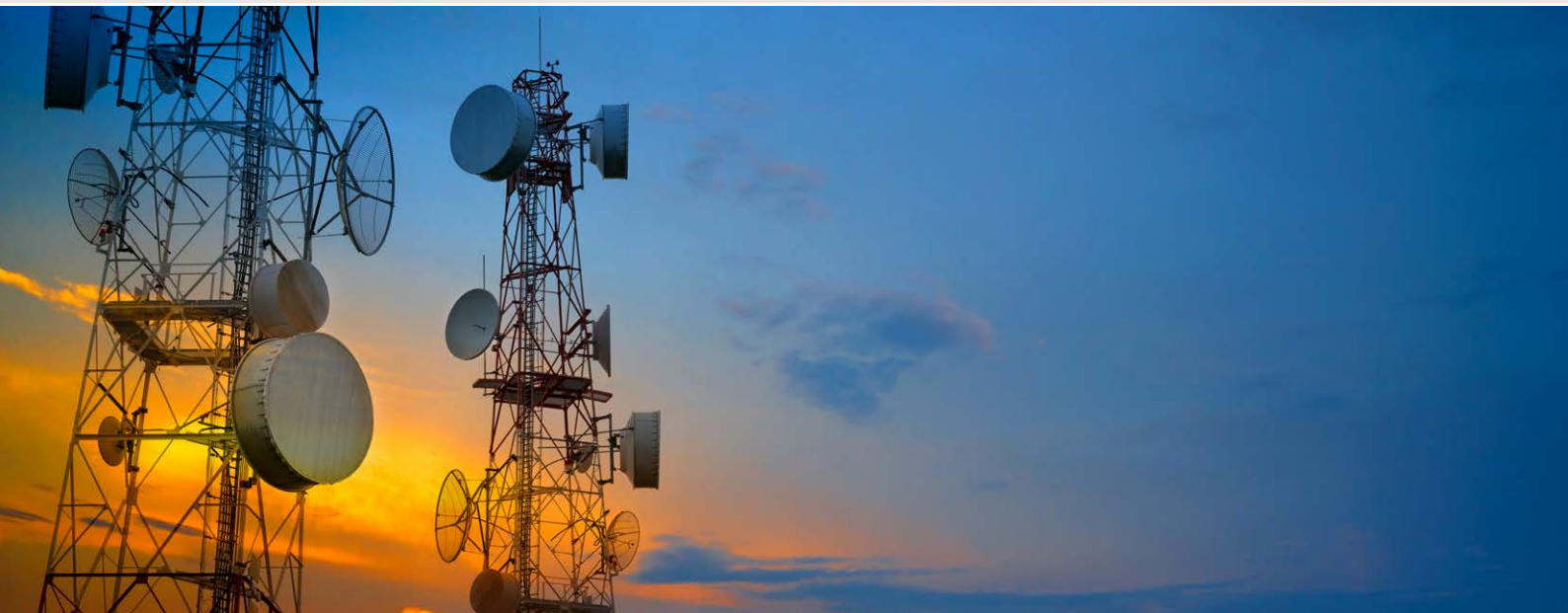
HX-CHX602A

High gain
foldable
Helix GNSS

Harxon
a BDStar company

Advanced D-QHA Technology

The Harxon helix antenna series adopts patented D-QHA (Dual Quadrifilar Helical Antenna) technology for stable performance of wide-angle circular polarization (WACP). This ensures exceptional low elevation satellite tracking while maintaining high gain and providing reliable signal tracking. This consistent performance combined with the antennas small form factor, lightweight and ability to integrate with inertial navigation systems makes it an ideal option for UAVs even in challenging environments.



Precise Time Synchronisation and Clock Reference Systems

Time synchronization is critical within any communication or control network. This is especially important in digital high-speed networks such as mobile phone and broadcast TV. If devices are not synchronized within your network, loss or corruption of your message data can occur. In electricity networks, precise synchronisation is critical for the deployment and control of Smart Grids. For financial transactions (even when accessing your internet bank account on your smartphone) time synchronization down to the nano-second level is critical for security, but even commercial and industrial organizations are starting to push for synchronization accuracy in the micro-second range.

The most secure and precise method for network time synchronization is using a local GNSS (Global Navigation Satellite System) time server as your master network clock. The time source from the GNSS network is highly accurate atomic clocks based in the satellites and synchronized with even more accurate ground stations. A GNSS based network time server provides you a Stratum 1 time source within your internal network that will be reliable, and unlike a public time server, is not impacted if the internet goes down.



Smart GNSS Antennas

Acutime™ 360 Multi-GNSS Smart Antenna

The Protempis Acutime™ 360 Multi-GNSS smart antenna is the latest generation Acutime product of integrated GNSS technology in a rugged and weatherproof self-contained unit. The Acutime 360 is an integrated pipe thread-mounted multi-GNSS receiver, antenna and power supply solution in a single environmentally sealed easy to install enclosure.

The Acutime 360 multi-constellation smart antenna design continues Protempis's line of GPS smart antennas, which have been in production since 1991.

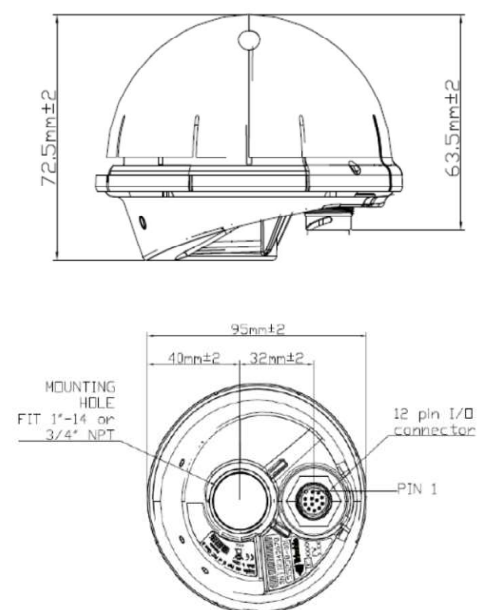
This antenna is the perfect solution for precise timing and network synchronization needs, including broadband wireless applications. It provides an extremely cost-effective and independent (within the firewall) timing source for any application, such as fault detection systems and synchronization of wireless networks.



Acutime 720™ GNSS Smart Timing Antenna

A ruggedized weatherproof dual-band (L1 & L5) multi-constellation receiver for timing that integrates the antenna and receiver into an enclosure that is ideal for outdoor installations. Offers precision time synchronization within 5 nanoseconds stability in its normal mode of operation. GPS (L1/L5), GLONASS (G1), Galileo(E1/E5a), Beidou (B1/B2a), QZSS (L1/L5) & NavIC (L5)

Constellations	Bands	Frequency (MHz)		
		Center	Lower	Upper
GPS	L1	1575.42	1573.42	1590
	L5	1176.45	1166.22	1186.68
QZSS	L1	1575.42	1573.42	1577.42
	L5	1176.45	1166.22	1186.68
GALILEO	E1	1575.42	1563.144	1587.696
	E5a	1176.45	1166.22	1186.68
GLONASS	G1	N/A	1598.0625	1605.37
BEIDOU	B1	1575.42	1559.052	1591.788
	B2a	1176.45	1166.22	1186.68
IRNS/NavIC	L5	1176.45	1164.45	1188.45



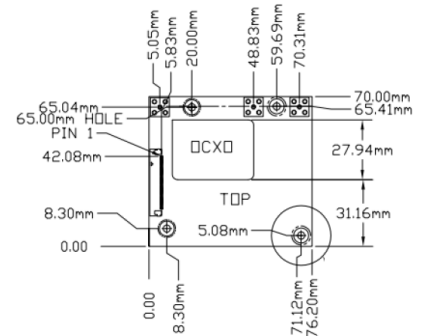
GPS Disciplined 10MHz and 1PPS Clock

Mini-T™ GG Multi-GNSS Disciplined Clock Board

Protempis's Mini-T™ GG disciplined clock module is a multi-GNSS (GPS and GLONASS) receiver, optimized for stationary applications to generate a precise timing signal. The Mini-T GG is designed to cover the large range of applications from radio base stations to digital broadcasting and smart grid.

The Mini-T GG gives OEMs the opportunity to embed a low-cost precise time and frequency reference, in our smallest form-factor yet. The Mini-T GG includes many of Protempis's standard timing features, including the Disciplined Clock Autonomous Integrity Monitoring (TRAIM) algorithm, and automatic self-survey.

The Mini-T GG generates pulse per second (PPS) and a precise 10MHz reference clock for synchronization of user applications.



Thunderbolt E GPS Disciplined Clock

The Protempis Thunderbolt® E GPS Disciplined Clock is Protempis's latest offering for GPS synchronization devices providing a 10MHz output and PPS.

This fifth-generation GPS clock combines a high-quality GPS receiver, control circuitry, and a reliable ovenized oscillator on a single board, providing increased integrity and reliability at a lower size and cost.

The Thunderbolt E GPS clock outputs a 10 MHz reference signal and a 1 PPS signal with an overdetermined solution synchronized to GPS or UTC time. The PPS output accommodates applications requiring sub-microsecond timing



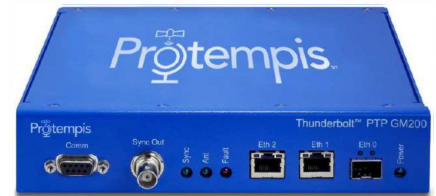
Time Servers

Thunderbolt® PTP Grandmaster Clock GM200

The Protempis Thunderbolt® PTP Grandmaster Clock is designed for the telecom market, for use at the edge of wireless networks requiring phase synchronization. The GM200 provides continuous availability of UTC traceable time for phase synchronization, a must for LTE-Advanced networks and services.

The Thunderbolt PTP GM200 employs industry-leading Protempis GNSS performance, and world class holdover technology.

The PTP GM200 tolerates harsh environmental conditions, supporting both indoors and outdoors deployments with an extended operating temperature range (-40 to +85 C). The Thunderbolt PTP GM200 supports small cells networks that require phase synchronization. Although it is designed with keeping small cells in mind, it meets Marco base station requirements for synchronization.



Thunderbolt® NTP Time Server TS200

The Protempis Thunderbolt® NTP TS200 Time Server is designed for demanding applications that require high-accuracy NTP time stamping.

It supports synchronization of thousands of workstations, routers, switches and other network elements for logging and security forensics. The Thunderbolt NTP TS200 supports multiple GNSS constellations, utilizing GPS, GLONASS, Galileo and Beidou satellites, thereby enhancing redundancy and satellite availability.

The NTP TS200 is optimized to deliver extremely stable and accurate time of day (TOD) synchronization for a variety of time-sensitive applications, such as telecom networks, data centers, factory automation, and SCADA systems.



Grand Master Clock Quazar 100

Integrated 72-channel high-precision GNSS receiver with support for GPS / QZSS, GLONASS, BeiDou, Galileo

- GNSS receiver sensitivity (max/min): -167dBm/-159dBm with LNA option
- IEEE 1588-2008v.2 (PTPv2): Precise time synchronization protocol with hardware support
- GNSS PPS Precision: ± 40 ns (Clear sky)
- OCXO generator with -40 to +70°C stability of ± 20 ppb and holdover time of ± 1.5 μ s at constant temperature for 0.5 hours.
- 100/1000Mbit/s UTP interface with M12 connector, IP65 waterproof
- Synchronous Ethernet (SyncE) support - ITU-T G.8261 and ITU-T G.8264
- Hardware and software support for SSM for Synchronous Ethernet,
- Built-in NTP / SNTP server
- Designed in accordance with the requirements of IEC61850-3, IEEE1613
- IP, HTTP, telnet, SSH, SNMP v1/v2c/v3 management,
- Power: PoE IEEE802.3af PD over STP/UTP cable
- Optional STP/UTP patchcord up to 100m with M12-RJ45 connectors
- Integrated ITU-T K-44 surge protection for the transmission path only.
- Operating temperature -40 to +70°C



- IEEE C37.238- 2011 or 2017 Power Profile I
- IEEE61850-9-3
- ITU-T G.8265.1
- ITU-T G.8275.1 (L2 multicast)
- ITU-T G.8275.2 (L3 unicast)
- Telecom 2008 over Ethernet

Quazar-200 Time Server

Industrial Time Server with GPS module equipped with 4-port 10 Gigabit Ethernet switch and optional 8x/100M/1G RJ45 or 8x 100M/1G SFP interfaces

- Managed time server for network synchronization equipped with interfaces of 4 SFP+ 1/2.5/10Gbps slots and 1x RJ45 10/100/1000Mbps ports; 1x PPS IN; 1 PPS OUT; 1x 10MHz IN/10MHz OUT; 1 x E1 G703/G.704; 1x ToD IN/ToD OUT optionally equipped with additional interfaces of 8x (10M/100M/1G) RJ45 or 8x 100M/1G SFP
- Supported synchronization protocols PTPv.2, NTP, SNTP, ToD, SSM, SyncE,
- GNSS PPS signal precision: ± 40 ns (Clear sky),
- Multisystem receiver for GPS, Galileo, Glonass, Beidou systems
- Additional NMI UTP RJ45 10/100Mbit/s management port
- Support for STP, RSTP and MSTP protocols.



- PTPv2 default IEEE 1588
- ITU-T G.8275.1
- ITU-T G.8275.2
- ITU-T G.8265.1
- IEC 61850-9-3
- IEEE C37.238-2011 and 2017

Quazar 500 Time server

Manageable Signal Quality Analyzer

- Managed network synchronization quality analyzer equipped with 4 SFP+ 1/2.5/10Gbps slots and 1 or 8 SFP+ 1/2.5/10Gbps slots and 2x RJ45 10/100/1000Mbps ports or 12 SFP+ 1/2.5/10Gbps slots 3x RJ45 10/100/1000Mbps ports (version with 12 slots only in 2U housing)
- Qualitative analysis by 4 instances of IEEE1588 PTPv.2 for profiles G.8275.1 (Telecommunications) and C37.238 (Energy)
- Qualitative analysis of up to 2 or 4 or 6 clock domains of Synchronous Ethernet with analysis of SSM ITU.T - G8264 messages.
- Accurate local OCXOs or DOCXOs for long-term holdover
- High-performance CPU for system management
- Built-in LCD display for reading selected parameters
- Radius authentication
- Internal data memory for local data archiving (up to 72h)
- IPv4, IPv6, WWW, telnet, SSH and local CLI console management, SNMP v1/v2c/v3
- Redundant power supply 80-360 V DC, 75-270 V AC or 45 - 60 V DC



Multi-system GNSS receiver supporting:

- GPS, Galileo, Glonass, Beidou
- PTPv.2
- NTP
- SyncE
- SNTP time server
- ToD
- PPS 10MHz
- G.703/G.704

Quazar-700 Time Server

Network Synchronisation Probe

- Quazar-700 enables monitoring of time and frequency synchronization in the radio access network (RAN), which allows for stable and efficient operation of the network. Thanks to this, the operator can provide a very good quality of services to its customers.
- The device allows for quick detection of PTP/SyncE failures (place and cause), which translates into quick operator response and minimization of failure repair costs. Thanks to Quazar-700, the operator can achieve very good service availability.
- Quazar-700 enables calibration, which translates into very good time precision. This allows the provision of new types of services offered by the 5G network, in particular IoT (Internet of Things), autonomous vehicles, etc.
- The Quazar-700 monitoring probes measure inaccuracy parameters in the existing DWDM infrastructure, allowing cTE and asymmetry values to be measured and corrected. This saves investment costs.
- The Quazar-700 can be used as a portable probe, offering flexible monitoring scenarios. Thanks to this, the operator can monitor time and frequency synchronization in different places of the network, which translates into quick response to problems



- PTPv2
- IEEE 1588
- ITU-T G.8275.1
- ITU-T G.8275.2
- ITU-T G.8265.1
- IEC 61850-9-3
- IEEE C37.238-2011 and 2017

Display Clocks

Power over Ethernet Clocks Deliver Accurate Time anywhere in the World

Power over Ethernet (PoE) clocks are a durable and precise technology that delivers accurate time anywhere. Easy to install with hardly any maintenance, these beautiful analog or digital locks give you peace of mind.



Wi-Fi Clocks use a Wi-Fi Network for Fast and Cost-Effective Synchronised Time

Wi-Fi clocks pull the correct time from your existing Wi-Fi network. Hang them anywhere you get a Wi-Fi signal, no electrician required.

Quality construction and five-year battery life means that the maintenance staff won't have to spend time fixing clocks. Keep events on time and get better productivity with all clocks, computers, phones, and other devices displaying the same time!

