CHCNAV

SWAS

SATELLITE-BASED WIDE AREA AUGMENTATION SERVICE

Global GNSS RTK Correction Services

CHCNAV

CENTIMETER-LEVEL ACCURACY VIA L-BAND AND NTRIP INTERNET

CHCNAV's GNSS RTK Correction Services combine L-Band satellite and internet-based NTRIP access to deliver centimeter-level precision for diverse applications, including precision surveying, agriculture, and autonomous driving. Powered by CHCNAV's global network of Continuously Operating Reference Stations (CORS), SWAS ensures seamless real-time corrections through NRTK, PPP, and PPP-RTK, providing reliable positioning in even the most remote locations. With SWAS, you can enhance operational efficiency and increase productivity, offering a dependable backup when connectivity is limited or unavailable.

Precision in Every Environment

Centimeter-Level RTK

CHCNAV's PPP and PPP-RTK services provide centimeter-level accuracy with L-band broadcasting and internet access. Achieving horizontal accuracy of 3 cm and vertical accuracy of 6 cm, the system delivers precise corrections with an initialization time as fast as 30 seconds to 10 minutes. With advanced algorithms, CHCNAV minimizes base station dependency by accurately calculating orbits, clock offsets, and atmospheric errors, delivering a global GNSS correction solution.

Reliable Performance in Challenging Conditions

Stable and Reliable in Any Environment

SWAS is designed to maintain consistent and reliable positioning, even in complex environments such as urban canyons and adverse conditions. Supporting GPS, GLONASS, Galileo, and BeiDou constellations across multiple frequencies, it offers redundancy and high-performance tracking, ensuring robust GNSS accuracy under all conditions.

Flexible NTRIP Access

Real-Time RTK Corrections over the Internet

SWAS offers NTRIP-based GNSS corrections for users requiring real-time kinematic (RTK) accuracy via the internet. Connect to CHCNAV's global CORS network and gain instant access to centimeter-level positioning without the need for additional base stations or complex infrastructure, simplifying operations and reducing costs.

Easy Integration and Scalability

Seamless Compatibility Across Systems

Our services supports a wide range of GNSS receivers with RTCM 3.X data formats and NTRIP 1.0/2.0 protocols. With SSR-to-OSR conversion capabilities for PPP-RTK, the system offers flexible integration options. Additionally, open APIs and SDKs are available for OEM customers, enabling fast deployment and development.

Efficient Data Transmission

40% Bandwidth Reduction with DCTP Technology

CHCNAV's Differential Data Compact Transmission Protocol (DCTP) reduces bandwidth usage by over 40%, lowering data consumption costs without compromising on performance. The system supports TLS protocol and incorporates multiple encryption methods for secure and reliable data transmission, ensuring data integrity and protection.

Global Coverage with L-Band Satellite

Access Corrections Anywhere

SWAS extends GNSS correction services far beyond terrestrial networks through L-Band satellite broadcasting, providing coverage in regions with limited or no ground-based infrastructure. This ensures that centimeter-level accuracy is available wherever your work takes you, offering a global solution for high-precision GNSS positioning.

Optimal Reliability Cloud-Based Ionospheric and Tropospheric Modeling

Stable and Reliable in Any Environment

CHCNAV's advanced ionospheric and tropospheric delay models are fine-tuned with real-time observational data. Our cloud-based system enables SWAS to cross-validate ionospheric models with GNSS receivers, delivering reliable and robust GNSS RTK positioning, regardless of environmental challenges.

99.99% Service Availability

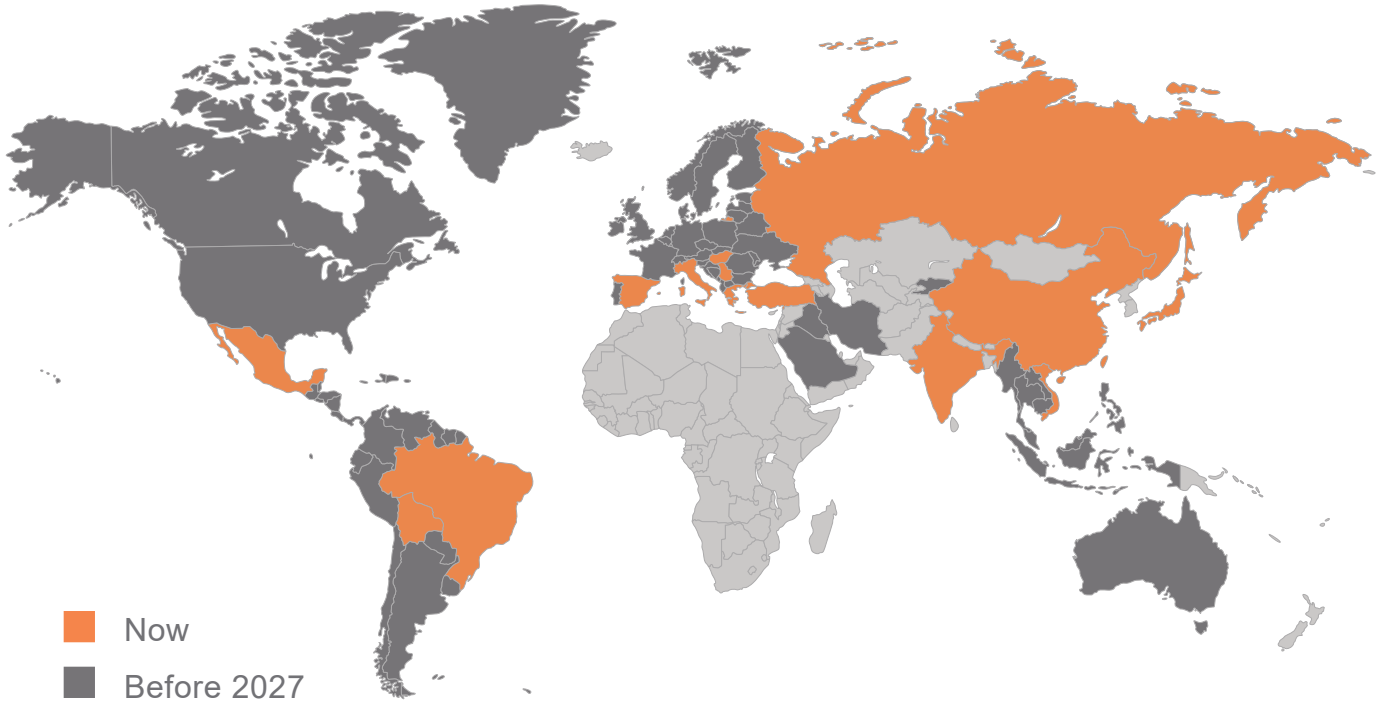
Redundant Infrastructure for Maximum Uptime

SWAS is supported by CHCNAV's P5 reference stations, built with fully redundant hardware infrastructure for primary location to ensure reliability. Hosted in Tier 4 data centers with load balancing and failover protocols, SWAS guarantees 99.99% uptime, ensuring uninterrupted service across all operations.

JOIN US!

BE PART OF OUR GLOBAL PARTNER NETWORK

High Reliability | Superior Precision | Broad Coverage | Easy Integration



Key Features

Excellent Performance

- Centimeter-Level Accuracy
- Second-Level Initialization
- Cloud and Terminal Modeling Integration

99.99% Availability

- High-Quality GNSS Reference Stations
- Multiple Data Centers with Load Balancing and Failover
- Dual Broadcast Modes: Network and L-Band

Cost-Effective Solution

- Proprietary Protocol for Bandwidth Reduction
- Flexible Billing Options: Pay Only for What You Use

Seamless Compatibility

- Supports RTCM 3.X and NTRIP 1.0/2.0
- CHCNAV Positioning Engine and Module Integration
- SDK and Open API for Quick Development

Global Coverage

- Worldwide Coverage with Local Support from 7 Subsidiaries
- Continuous Deployment Based on User Demand

SPECIFICATIONS

	NRTK	PPP / PPP-RTK
Positioning Performance		
Accuracy (2σ)[1]	Horizontal: < 2.5cm Vertical: < 5cm	Horizontal: < 3cm Vertical: < 6cm
Initialization Time (2σ)[2]	< 5 s	Standard: 3min -10min Fast: 10s - 3min[3]
Supported GNSS Signals	BDS: B1I/B1C/B2I/B2a/B3I GPS: L1/L2/L5 GLONASS: L1/L2 Galileo: E1/E5a/E5b QZSS: L1/L2/L5	BDS: B1I/B1C/B2I/B2a/B3I GPS: L1/L2/L5 GLONASS: L1/L2 Galileo: E1/E5a/E5b
Service Reliability		
Availability	≥99.99%	≥99.99%
Concurrency	$>10^6$	$>10^6$
Compatibility		
Data Format	RTCM 3.X	RTCM 3.X / Proprietary Data Format
Broadcast Data	OSR	SSR / OSR
Protocol Version	NTRIP 1.0 / 2.0	NTRIP 1.0 / 2.0
Broadcast Method	Network	Network / L-Band
Encryption	Support TLS 1.3	Support TLS 1.3
Security and Management		
Quality Control	ISO 9001 / ISO 20000 / ISO 27001	ISO 9001 / ISO 20000 / ISO 27001
Integration Method	SDK / Open API	SDK / Open API

*All specifications are subject to change without notice.
(1) Accuracy is influenced by hardware and environment. The typical results are based on compatible receivers.
(2) Initialization time depends on ionospheric activities.
(3) Station distance 200km, convergence: 2min ; Station distance 100km, convergence: 20s-40s; Station distance 50km, convergence: <10s.

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