

WHO ARE WE?

Founded in 2012, ComNav Technology is a world leading hi-tech company focused on high-precision GNSS technologies. ComNav Technology engages in R&D, manufacturing, sales and services, aiming to provide worldwide customers with high-precision GNSS chips, modules, terminals, software and solutions across industries.



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SinoGNSS[®]
By ComNav Technology Ltd.

PRECISE EARLY WARNING, AWAY FROM EMERGENCIES.

SINOGNSS MONITORING SOLUTIONS
VERSATILE & RELIABLE FOR VARIOUS MONITORING TASKS

MONITORING APPLICATIONS

Nowadays, monitoring has penetrated into all walks of life, including structure health monitoring, construction monitoring and environmental monitoring. Benefiting from the wide application of monitoring, people can obtain early warning of some natural disasters, building damage and other accidents, ensuring the safety of life and property. Meanwhile, monitoring data such as environment and transportation can contribute to the development of human science and technology. In all, monitoring has played an important role in people's daily lives. ComNav Technology can provide users with the best-in class monitoring solutions for various applications.

Structure Health

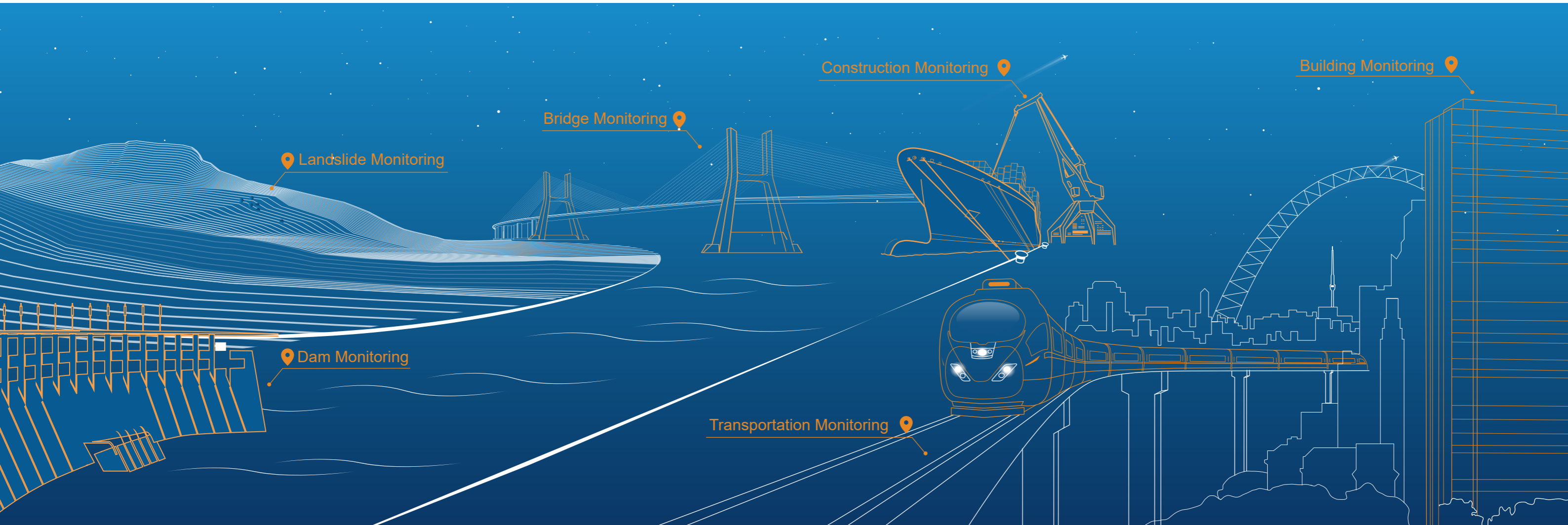
Man-made structures including buildings, bridges, dams, reservoirs, hydropower stations, tunnels, transportation, etc.

Construction

Monitoring during construction projects, including building constructions, mining, foundations, tailings ponds, etc.

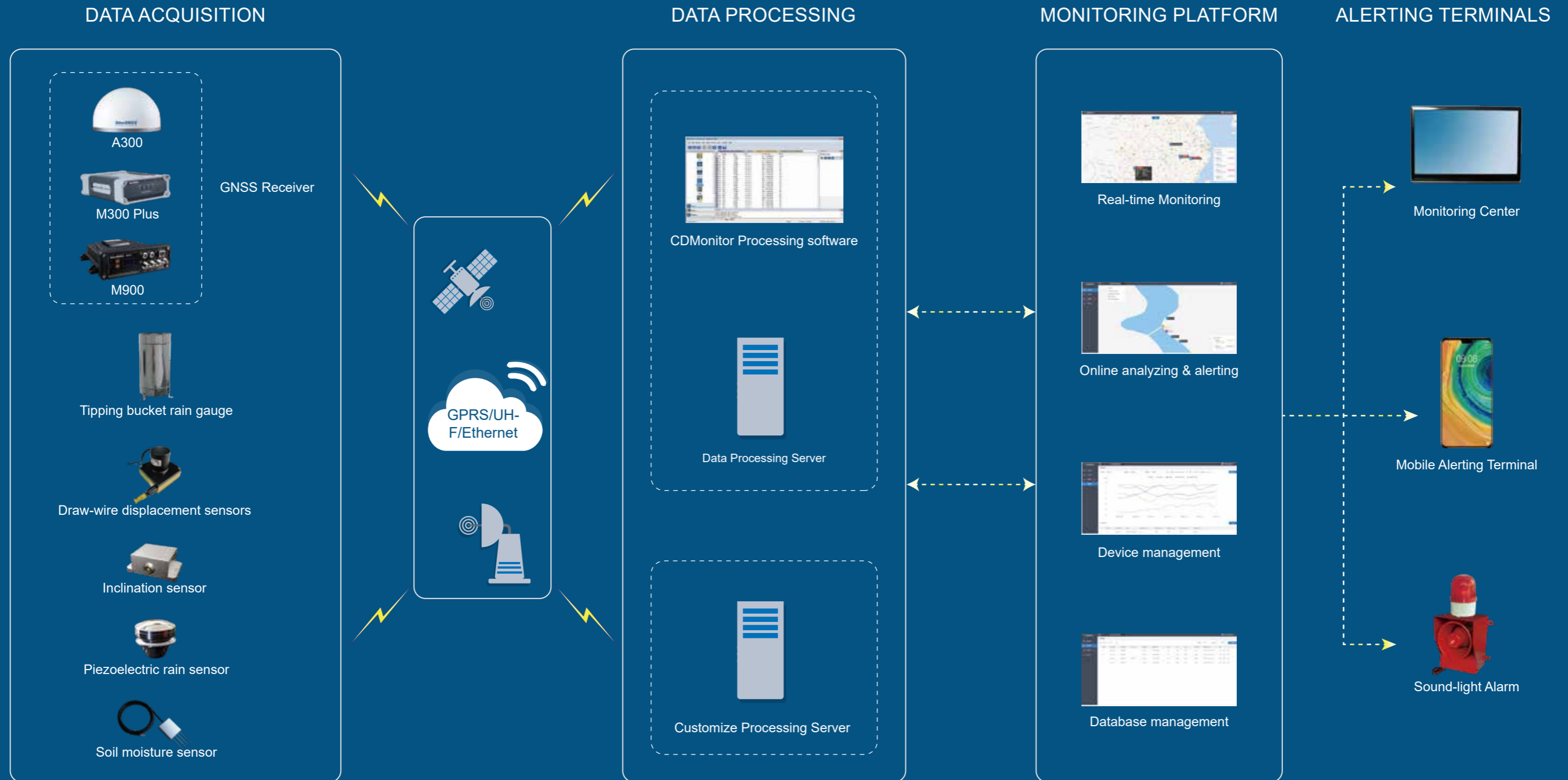
Environmental

Natural changes and disasters including landslide, underground waters, permafrost, rainfall, surface displacement, etc.



SINOGNSS MONITORING SOLUTIONS

Monitoring always plays an important role in ensuring the convenience and safety of people, such as geological disasters monitoring, man-made structures monitoring and etc. The advanced SinoGNSS monitoring system consists of data acquisition system, data transmission system, data processing server, monitoring platform and alerting terminals, which can provide users with an automated, comprehensive and reliable monitoring solution.



SINOGNSS MONITORING SOLUTIONS ADVANTAGES



Automated Monitoring

From data acquisition, data transmission, data processing to data monitoring and alarm, ComNav Technology provides users with an automated monitoring solution with complete workflow.



Remote Management

Remote configuration, management and monitoring of onsite monitoring sensors via web UI of SinoGNSS receivers and CDMonitor software.



Real-time Monitoring

Benefit from the stable monitoring data transmission of SinoGNSS receivers and the dynamic processing ability of CDMonitor software, offering real-time data monitoring and analysis.



24/7 Long-Term Operation

With reliable hardware which passed strict QC procedures and CDMonitor for system integrity monitoring, ComNav Technology provides users with 24/7 trouble-free monitoring solution.



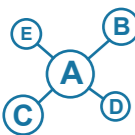
Millimeter-Level High Accuracy

Capable of tracking and solving all running and planned constellations, adopted with advanced Kalman filter algorithm, the monitoring accuracy is up to millimeter level.



Flexible Communication

Providing UHF/4G/Ethernet/serial port for data transmission, SinoGNSS monitoring solution is flexibly applicable to various environments.



Multi-Sensors Compatible

Except GNSS receivers, the SinoGNSS Monitoring Solution also supports other monitoring sensors, such as rain gauge, inclination sensor, displacement sensor, soil moisture sensor and so on.



Multiple optional device

Providing UHF/4G/Ethernet/serial port & TCP/IP, MQTT, Ntrip protocols for data transmission, which is flexibly applicable to various environments



RELATED PRODUCTS

A300

GNSS Receiver



SinoGNSS A300 integrated GNSS module, GNSS antenna and communication module in one compact receiver. Reliable and convenient user experience is ensured via compact design, high-precision positioning and flexible transmission of A300. As a universal GNSS receiver, A300 is compatible with multiple sensors in facing of different kinds of monitoring tasks, which is one of the best choices for your monitoring solutions.

FEATURES



Millimeter Accuracy

Capable of tracking all running constellations, A300 receiver can reach millimeter-level positioning accuracy for precise monitoring.



Multi-sensors

Supporting versatile external sensors for multi-sensor integrated monitoring, A300 can flexibly match different sensors according to different monitoring applications.



Remote Monitoring

Benefit from flexible 4G/UHF transmission, users can check the positioning data and warning information anywhere and anytime.



Easy Configuration

Partnered with Android-based SinoGNSS Navigate Master software, it is easy to configure A300 via Bluetooth connection.



Flexible Transmission

Supporting serial port/USB/UHF/ Bluetooth/4G communication media and TCP/IP, MQTT, Ntrip communication protocols.



24/7 Operation

Through strict quality control procedures, the MTBF of the A300 receiver can reach more than 50,000 hours for long-term trouble-free operation.



Rugged Housing

Featuring IP68 proof level, anti-vibration and anti-lightning, the A300 receiver is not afraid of harsh working environments.



8GB Large Memory

Equipped with 8GB internal memory and loop recording function, the A300 can meet your data logging requirement for monitoring.

Signal Tracking

GPS	L1C/A, L2P, L2C, L5, L1C
GLONASS	L1, L2
BDS	B1I, B2I, B3I, B1C, B2a, B2b
Galileo	E1, E5b, E5a
QZSS	L1C, L2, L5
IRNSS	Upgradeable
SBAS	L1, L5

Performance Specification

Cold start	<60 s
Hot start	<15 s
Initialization time	<10 s
Signal re-acquisition	<1 s
Initialization reliability	>99.9%
Overload	15 g
Time accuracy	20 ns

Positioning Specifications

Post Processing	2.5 mm + 1 ppm Horizontal 5 mm + 1 ppm Vertical
Single Baseline RTK	8 mm + 1 ppm Horizontal 15 mm + 1 ppm Vertical
DGPS	<0.4 m RMS
SBAS	1 m 3D RMS
Standalone	1.5m 3D RMS

Interfaces

1 14-pin Lemo port	Serial ports, USB port, power, switching value Support external sensors input
1 TNC connector	UHF modem
2 SIM card slots	4G modem, dual SIM dual standby

Communication

Serial port	RS232, RS485
USB	USB 2.0
UHF modem	Frequency range: 410MHz-470MHz Transmit power: 0.5-2 W adjustable Range: 8-15 km, varies in different environments
Bluetooth	4.1/2.1+EDR, 2.4GHz
Network	TCP/IP, MQTT, Ntrip
Indicator LEDs	4 LEDs, indicating power, satellite searching, correction data and GSM status

Data Format

Correction data I/O	RTCM 2.X, 3.X, CMR (GPS only),
Position data output	NMEA-0183, ComNav Binary, RTCM2.X, RTCM3.X
Data update rate	60s, 30s, 15s, 10s, 5s, 1Hz, 2Hz, 5Hz, 10Hz

Physical

Size (L × W × H)	φ205mm*126.5mm
Weight	≤2kg
Housing	FRP cover & aluminum alloy base

Environmental

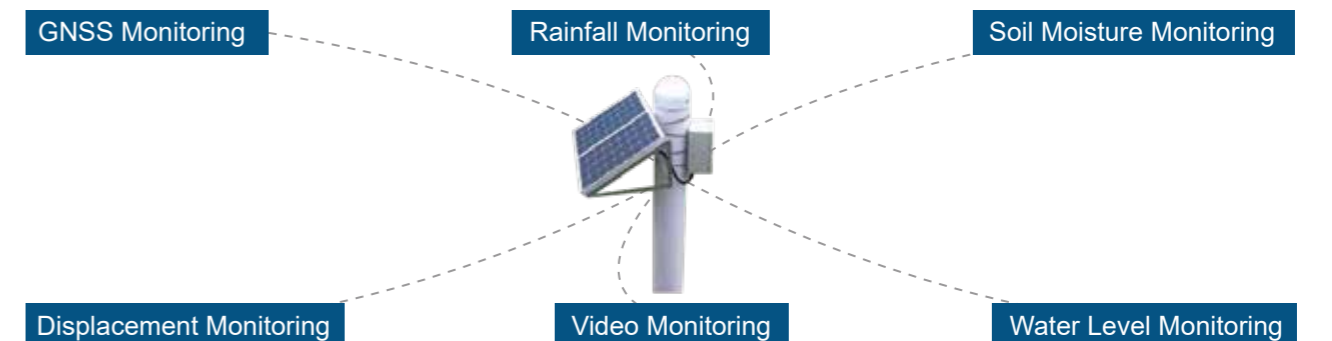
Operating Temperature	-40°C to +70°C
Storage Temperature	-55°C to +85°C
Humidity	100% No-condensing
Waterproof and Dustproof	IP68
MTBF	≥50000h

Electrical

Input voltage	6-36 VDC, overvoltage protection
Power consumption	<2 W

TYPICAL APPLICATION

Multi-sensor integrated monitoring station.



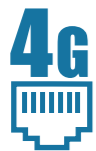
M300 PLUS

GNSS Receiver



Featuring SinoGNSS QUANTUM™ Technology for full-constellation tracking and high precision positioning capability, abundant interfaces for flexible communication, the M300 Plus GNSS receiver is one of the most robust and cost-effective GNSS solutions for CORS and monitoring.

FEATURES



Stable Network Connection

Besides the standard Ethernet port for data transmitting, M300 Plus also fully implements a 4G module as a backup, which can enhance the stability of the Network connection.



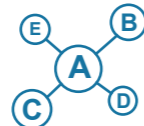
Large Capacity Memory

Default 32GB internal memory meets your data logging requirement in a wide range of monitoring applications. It also supports up to 1TB removable storage.



User Management

It supports different-level user permission access, which helps the administrator ease of management.



Abundant Interfaces

Abundant interfaces including USB, RS232, RS485, Event, PPS, 4G, LAN and Oscillator for external devices connection and data transmission that substantially increase your work efficiency and flexibility.



Standard Communication Protocols

Ensure easy configuration through HTTP protocol, or TCP/IP, support five independent data transfer through TCP protocol in RTCM, ComNav binary, NMEA, BINEX data formats and NTRIP protocols.



Rugged Design

Designed with IP67 Dust & Water proof protection and survive from 1m drop onto the concrete. Its working temperature ranges from -40°C to +80°C.

M900 SE

GNSS Receiver



SinoGNSS M900 SE receiver is a cost-efficient choice for various monitoring tasks. Featuring the new K8-platform, stable data transmission, abundant interfaces and rugged design, the M900 SE can satisfy most monitoring requirements of users.

FEATURES



Full-constellation Tracking

Featuring 965 channels for simultaneously tracking all running and planned constellations, M900 SE can provide reliable and stable positioning.



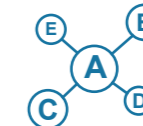
Stable Network Connection

Equipped with both Ethernet and 4G module for mutual backup, enhancing the stability of the Network connection.



Easy Configuration

M900 SE can be configured via its OELD Display and buttons, the WiFi/LAN webpage, or the Bluetooth by Navigate Master software.



Abundant Interfaces

M900 SE receiver implements with abundant interfaces for external devices and data transmission.



IP68

With IP68 waterproof and dustproof level and shock-proof design, M900 SE can be used in harsh working environments.



Standard Format

Support RTCM2.X, 3.X, CMR/CMR+, NMEA 0183, ComNav Binary and BINEX data format to meet different requirements of users.

GNSS ANTENNAS

SinoGNSS AT-series are high-performance antennas that can track all running and planned constellations. With strong tracking ability, rugged housing and good compatibility with M300 Plus, M900 and other GNSS receivers, the AT-series antennas are good choices for users to develop systems or GNSS related monitoring solutions.

AT360 Gedetic Antenna



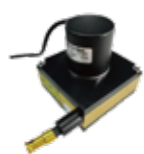
- ◆ Support GPS L1/L2/L5, GLONASS L1/L2, BDS B1/B2/B3, Galileo E1/E5a/E5b, SBAS and L-Band
- ◆ Low noise amplifier and high gain
- ◆ Millimeter level phase center error with outstanding stability and repeatability
- ◆ Strong capability of tracking satellites at low elevation angle
- ◆ Superior IP67 waterproof and dustproof design

AT600 Choke Ring Antenna



- ◆ Support BeiDou B1/B2/B3, BeiDou Global B1C/ B2a, GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E5a/E5b/E6, IRNSS, QZSS, SBAS and L-Band
- ◆ 3D choke ring structure design with excellent multipath rejection capability
- ◆ Low noise amplifier to improve anti-interference performance
- ◆ Sub-millimeter level phase center error with outstanding stability and repeatability
- ◆ High gain for strong low elevation angle signal tracking capability
- ◆ Superior IP68 water and dust-proof level make it capable for work in harsh environment

OTHER SENSORS



Draw-wire displacement sensors



Tipping bucket rain gauge



Inclination sensor

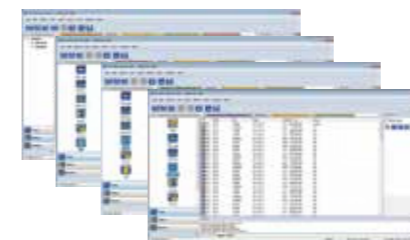


Piezoelectric rain sensor



Soil moisture sensor

CDMONITOR



CDMonitor is a professional real-time GNSS data processing and monitoring software. Adopted with Kalman filter algorithm, the monitoring accuracy of CDMonitor is up to millimeter level. With the capability of real-time monitoring, remote management, strong data processing, early alerting, the CDMonitor can be widely used in monitoring applications such as mining monitoring, construction monitoring, dams & hydropower monitoring and geodetical disaster monitoring.

FEATURES



Strong Data Processing

Capable of receiving and processing plenty of GNSS data from multiple base stations and monitoring stations synchronously, CDMonitor is a powerful data processing center.



Early-alerting Function

Based on the real-time data monitoring, once the data exceed the threshold range, the system can perform sound & light alarms, SMS alarms and email alarms to remind relevant personnel to take measures.



Millimeter Level Accuracy

Featuring with advanced Kalman filter algorithm, full-constellation & full-frequency GNSS data processing capability, CDMonitor can easily realize millimeter-level monitoring.



Status Recording

Equipped with the ability of recording both monitoring data status and system working status, CDMonitor makes it more convenient for users to troubleshoot.



Real-time Monitoring

CDMonitor supports both static and dynamic processing modes, offering real-time data and graphic display of baseline and coordinate changes, which is convenient for status monitoring and analysis.



Remote Control

CDMonitor can realize remote configuration for the onsite monitoring devices, remote query and management for the monitoring GNSS data.



24/7 Operation

CDMonitor supports long-term trouble-free operation and system integrity monitoring for monitor the health of the entire system, providing a reliable and accurate 24/7 monitoring solution for users.

NAVICLOUD PLATFORM



SinoGNSS NaviCloud Platform is an online analyzing monitoring platform, which includes real-time monitoring system, online analyzing & alerting system, device management system and database management system.

FEATURES



Real-time monitoring

Provide real-time data and graphic display of monitoring data changes to facilitate status monitoring and analysis.



Early-alerting Function

Support online alarm threshold setting and early-alerting via sound & light alarms, SMS alarms and email alarms.



Online management

Providing online device management and database management service for remote control.



Customized functions

Support customized functions according to the specific requirements of the project and customers.

NAVIGATE MASTER



Navigate Master is an Android-based software that integrates a variety of configuration functions to meet the needs of industries such as car navigation, intelligent transportation, deformation monitoring, and precision agriculture.

The A300 and M900 SE GNSS receivers can be easily configured via the Navigate Master software. With Bluetooth connection and clear software interface, it is easy and convenient for users to operate.

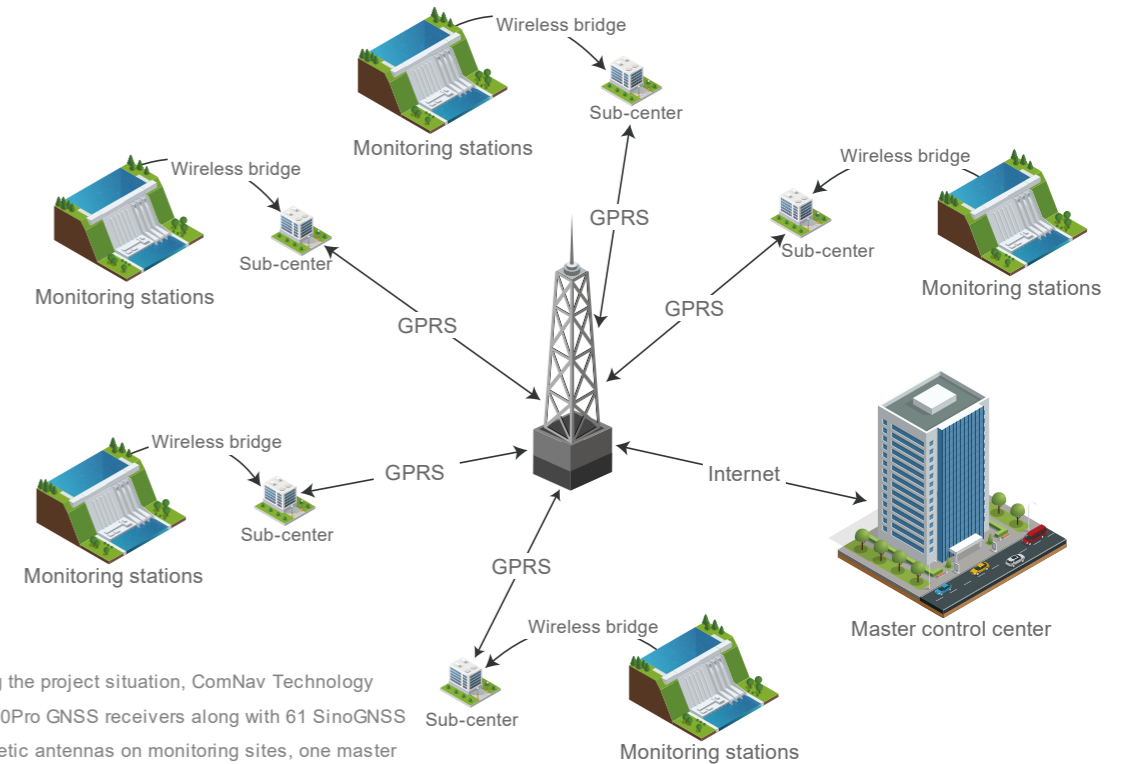
CASE STUDY

Located on the Jinsha River, Xiluodu is a multipurpose project including power generation, sedimentation, flood control, downstream navigation improvement and has a total installed capacity of 13.86 million kilowatts and an average annual power generation of 57.12 billion kWh, which is the second-largest hydropower station in China. The complicated terrain around the station is distributed with many landslides, which are very easy collapse and deformation, especially when large water storage.



To ensure the long-term safety of station infrastructures and employees, a continuous slope monitoring system that can simultaneously monitor all landslides is required. Chengdu Engineering Corporation Limited acquired an automation deformation monitoring solution from ComNav Technology in April 2014 for continuously monitor overall deformations of the Xiluodu Hydropower station, providing remote data access and automatic alert if any observation value exceeds limit level.

System Design



Overall considering the project situation, ComNav Technology built totally 61 M300Pro GNSS receivers along with 61 SinoGNSS AT330 GNSS geodetic antennas on monitoring sites, one master control center in customer's office, and 6 sub-control centers around landslides. The real-time monitoring and alerting were realized by CDMonitor software.