NAVSYS
TECHNOLOGY INC

www.navsys-tech.com

HIGH PRECISION

POSITIONING SERVICE


High-Precision
Positioning Technologies
GNSS
Technology
Monitoring Facilities
Using Ultra-Precise GNSS
Displacement Positioning
Technology

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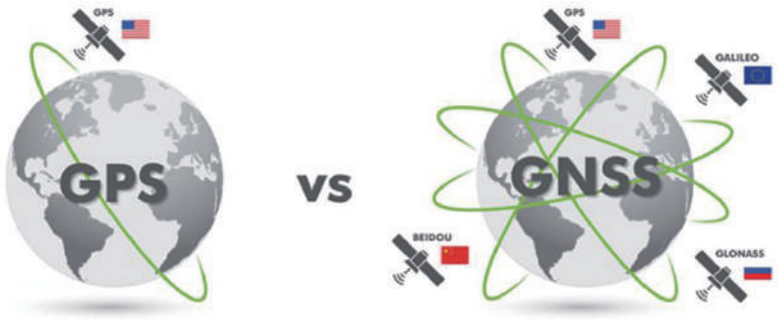
GNSS(Global Navigation Satellite System)
GPS (USA), GLONASS (Russia), BeiDou (China), and Galileo (Europe) a navigation satellite system operating across the globe

Facilities safety monitoring through ultra-precise displacement positioning using GNSS,
The overall importance of industries such as autonomous driving and precise position correction services is increasing



GPS is a single satellite system that utilizes 31 satellites

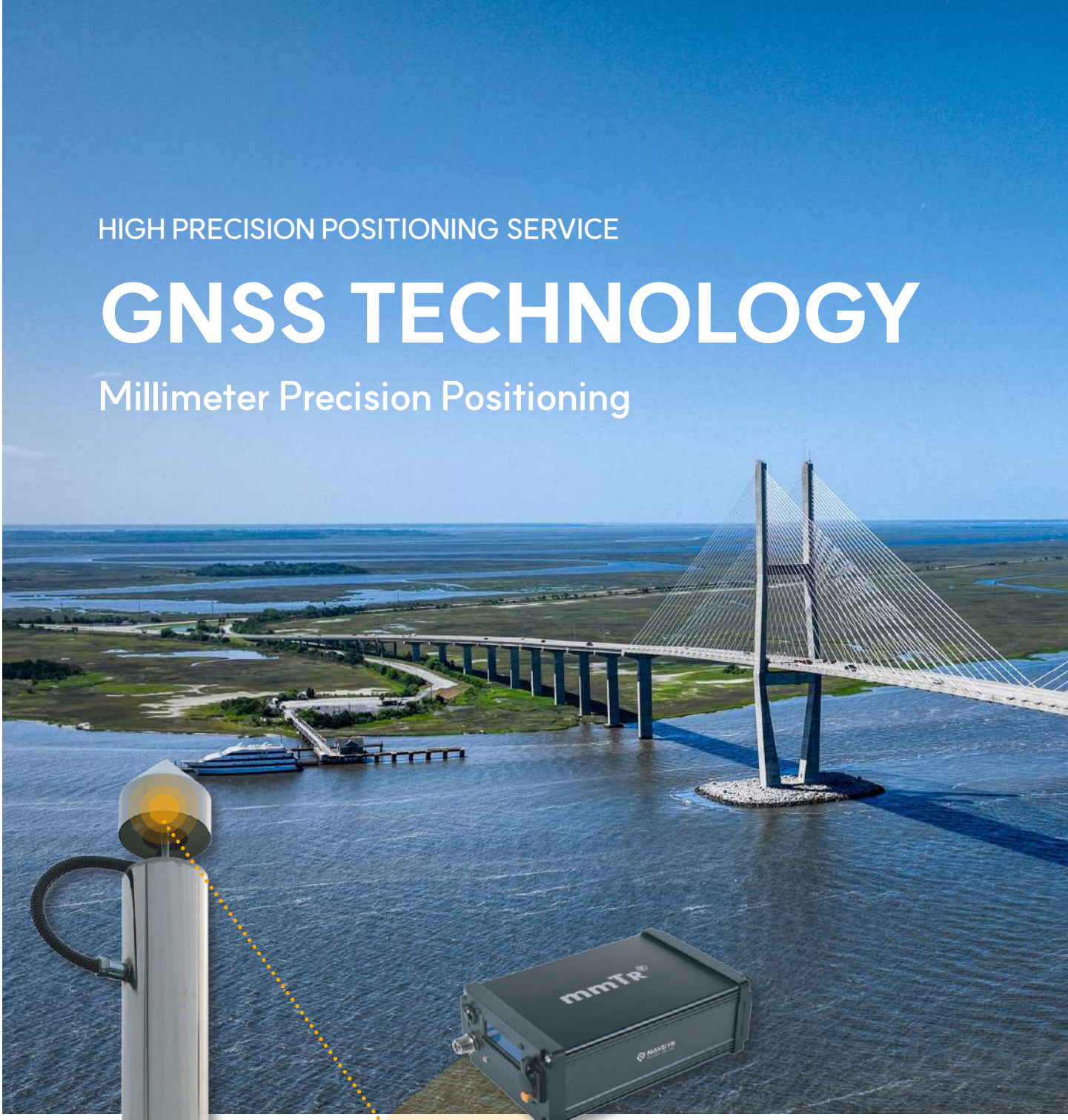
GPS utilizes 89 satellites from all 4 satellite systems

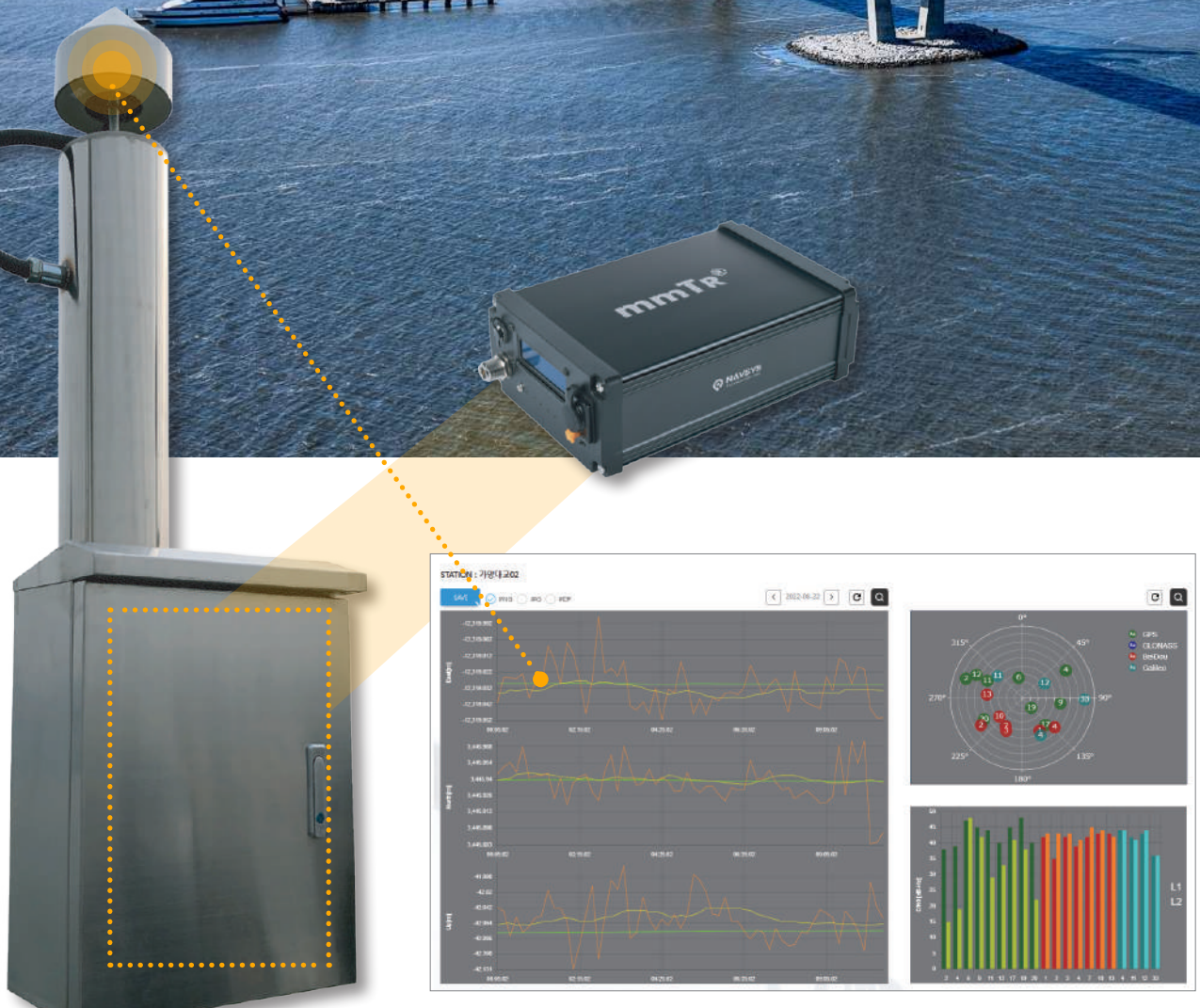
Location correction

HIGH PRECISION POSITIONING SERVICE

GNSS TECHNOLOGY

Millimeter Precision Positioning





Bridge monitoring

Roilroad facility monitoring

Slope monitoring

mmTR®-S Plus

High performance,
embed multi-GNSS receiver

FEATURES

mmTR®-S Plus is a high-performance, embedded multi-GNSS receiver which is especially designed for mm-level high-precision applications, and is a basic component of NavSys's other products.

GNSS signal tracking

544 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1C, L1PY, L2C, L2P, L5
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, b2I, B3
- Galileo: E1, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1C, L2C, L5, L6
- Navic: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

NavSys's proprietary technologies

- On-board, embedded modules:
  Multi-band, multi-constellation GNSS chipset
  UPS (Uninterruptable Power Supply) for DC power, solar cell and battery
  Network switching hub for GNSS data communication
  Watch dog for auto/remote system reset
- Related Patents: 10-2458817 (Korea)

PERFORMANCE

RTK performance

- Horizontal accuracy: 6mm + 0.5ppm
- Vertical accuracy: 10mm + 1ppm
- Initialization time: ≤ 7s

Other positioning performance

- Standalone: 1.2m(Horizontal) 1.9m(Vertical)
- DGNSS: 0.4m(Horizontal) 0.7m(Vertical)
- PPP: 0.04m(Horizontal) 0.06m(Vertical)

GNSS output

- Position: ≤ 100Hz
- Measurements: ≤ 100Hz

Time to first fix

- Cold start: < 45s
- Warm start: < 20s
- Re-acquisition: 1s

C/N0 threshold

- Tracking: 20 dB-Hz
- Acquisition: 33 dB-Hz

PHYSICAL & ENVIRONMENTAL

Electrical

- Input voltage: 12.0V
- Power consumption: 36W max

Environmental

- Operating temp: -40 to 85 °C
- Storage temp: -55 to 85 °C
- Humidity: 5-95%(non-condensing)
- Vibration: MIL-STD-810G
- Certification: KC, CE, RoHS, WEEE
- Registration No.: R-R-Nmm-mmTR-SPlus

Receiver

- Size: 156(w) x 80(H) x 240(L)mm
- Weight: 1,450g
- Back-up memory size: 64GB

mmTR® ServerPlus

High precision
multi-GNSS IoT system

FEATURES

mmTR®Server Plus is a real-time, powerful IoT (Internet of Things) system that integrates a GNSS receiver, a wireless/wired communication device, and a data processor.

GNSS signal tracking

544 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1C, L1PY, L2C, L2P, L5
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, B2I, B3
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1C, L2C, L5, L6
- Navic: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

NavSys's proprietary technologies

- OMEGA: a powerful GNSS integer ambiguity search engine for RTK (Real-Time Kinematic)
- MF-PPP: a unique GNSS measurement filtering-based PPP (Precise Point Positioning) engine
- MMTR: "MilliMeter TRacker"-a parallel processing engine for millineter-level infrastructure monitoring
- Related Patents: 10-2458817 (Korea)

PERFORMANCE

RTK performance

- Horizontal accuracy: 6mm + 0.5ppm
- Vertical accuracy: 10mm + 1ppm
- Initialization time: ≤ 7s

MMTR monitoring performance

- Horizontal accuracy: 1mm + 0.3ppm
- Vertical accuracy: 2mm + 0.5ppm
- Initialization time: ≤ 30min

GNSS solution

- Position outputs: ≤ 100Hz(default 1Hz)
- Measurements: ≤ 100Hz

PERIPHERAL

On-Board

- Processor: Intel Celeron N5105(2.9GHz)
- Memory: DDR4 SO-DIMM(8GB)
- Networking: RJ45(10/100/1000/2500Mbps)

PHYSICAL & ENVIRONMENTAL

Electrical

- Input voltage: 15.0V
- Power consumption: 60W max

Environmental

- Operating temp: -40 to 85 ℃
- Storage temp: -55 to 85 ℃
- Humidity: 5-95%(non-condensing)
- Vibration: MIL-STD-810G
- Certification: KC, CE, RoHS, WEEE
- Registration No.: R-R-Nmm-mmTR-SPlus

Receiver

- Size: 156(w) x 80(H) x 240(L)mm
- Weight: 1,450g
- Main Storage: 250GB
- Back-up memory size: 64GB

mmTR® Centro

Centralized multi-GNSS processing system

FEATURES

mmTR®Centro is a real-time, cost-effective GNSS central processing system that communicates with a reference station and multiple rovers and processes a number of baselines simultaneously.

GNSS signal tracking

544 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1C, L1PY, L2C, L2P, L5
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, B2I, B3
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1C, L2C, L5, L6
- Navic: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

NavSys's proprietary technologies

- OMEGA: a powerful GNSS integer ambiguity search engine for RTK (Real-Time Kinematic)
- MF-PPP: a unique GNSS measurement filtering-based PPP (Precise Point Positioning) engine
- MMTR: "MilliMeter TRacker"-a parallel processing engine for millineter-level infrastructure monitoring
- Related Patents: 10-2458817 (Korea)

PERFORMANCE

RTK performance

- Horizontal accuracy: 6mm + 0.5ppm
- Vertical accuracy: 10mm + 1ppm
- Initialization time: ≤ 7s

MMTR monitoring performance

- Horizontal accuracy: 1mm + 0.3ppm
- Vertical accuracy: 2mm + 0.5ppm
- Initialization time: ≤ 30min

GNSS solution

- Position outputs: ≤ 20Hz(default 1Hz)
- Number of baselines: Unlimited(default 10)

PERIPHERAL

On-Board

- Processor: Intel Celeron N5105(2.9GHz)
- Memory: DDR4 SO-DIMM(8GB)
- Networking: RJ45(10/100/1000/2500Mbps)

PHYSICAL & ENVIRONMENTAL

Electrical

- Input voltage: 15.0V
- Power consumption: 60W max

Environmental

- Operating temp: -40 to 85 ℃
- Storage temp: -55 to 85 ℃
- Humidity: 5-95%(non-condensing)
- Vibration: MIL-STD-810G
- Certification: KC, CE, RoHS, WEEE
- Registration No.: R-R-Nmm-mmTR-SPlus

Receiver

- Size: 156(w) x 80(H) x 240(L)mm
- Weight: 1,450g
- Main Storage: 500GB
- Back-up memory size: 64GB

mmTR® Caster

Multi-mode GNSS

reference station system

FEATURES

mmTR®Caster is a real-time, powerful GNSS reference station system that enables access to public/private GNSS networks and transmits GNSS correction data to numerous clients.

GNSS signal tracking

544 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1C, L1PY, L2C, L2P, L5
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, B2I, B3I
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1C, L2C, L5, L6
- Navic: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

NavSys's proprietary technologies

- Compatible with private/public GNSS reference station networks (e.g., GNSS CORS network)
- Continuous monitoring of short and logn-term stability of GNSS correction data service for a number of simultaneous clients
- Related Patents: 10-2480741, 10-2538541 (Korea)

PERFORMANCE

GNSS network access

- CORS(public) network: compatible
- Local(private) network: compatible

GNSS correction service

- Number of clients: max65,000(default 100)
- Service expansion: Modularized

GNSS output

- Measurements: ≤ 100Hz

PERIPHERAL

On-Board

- Processor: Intel Celeron N5105(2.9GHz)
- Memory: DDR4 SO-DIMM(8GB)
- Networking: RJ45(10/100/1000/2500Mbps)

PHYSICAL & ENVIRONMENTAL

Electrical

- Input voltage: 15.0V
- Power consumption: 60W max

Environmental

- Operating temp: -40 to 85 ℃
- Storage temp: -55 to 85 ℃
- Humidity: 5-95%(non-condensing)
- Vibration: MIL-STD-810G
- Certification: KC, CE, RoHS, WEEE
- Registration No.: R-R-Nmm-mmTR-SPlus

Receiver

- Size: 156(w) x 80(H) x 240(L)mm
- Weight: 1,450g
- Main Storage: 250GB
- Back-up memory size: 64GB

mmTR® Vibro

GNSS – based vibration monitoring system

FEATURES

mmTR® Vibro is a real-time, unique GNSS-based vibration minitoring system that detects vibration parameters (e.g., frequency, amplitude, 3D direction) from the infrastructures of interest.

GNSS signal tracking

544 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1C, L1PY, L2C, L2P, L5
- GLONASS: L1CA, L2CA, L2P, L3 CDMA
- Beidou: B1I, B1C, B2a, B2I, B3
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1C, L2C, L5, L6
- Navic: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

NavSys's proprietary technologies

- Spectral Analyzer: based on Lomb-Scargle Periodogram Efficient computation of a Fourier-like power spectrum estimator Detection of periodic signals in unevenly sampled GNSS data A single GNSS antenna/receiver system to detect 3D vibrations (i.e., radial, horizontal, and wertical) simultaneously
- Related Patents: 10-2458817 (Korea)

PERFORMANCE

Vibration performance

- Frequency detection: ≤ 50Hz
- Amplitude detection: ≥ 2mm
- Direction detection: Radial / Horizontal / Vertical

GNSS solution

- Position outputs: ≤ 100Hz(optional)
- Vibration outputs: Variable(user defined)

PERIPHERAL

On-Board

- Processor: Intel Celeron N5105(2.9GHz)
- Memory: DDR4 SO-DIMM(8GB)
- Networking: RJ45(10/100/1000/2500Mbps)

PHYSICAL & ENVIRONMENTAL

Electrical

- Input voltage: 15.0V
- Power consumption: 60W max

Environmental

- Operating temp: -40 to 85 ℃
- Storage temp: -55 to 85 ℃
- Humidity: 5-95%(non-condensing)
- Vibration: MIL-STD-810G
- Certification: KC, CE, RoHS, WEEE
- Registration No.: R-R-Nmm-mmTR-SPlus

Receiver

- Size: 156(w) x 80(H) x 240(L)mm
- Weight: 1,450g
- Main Storage: 250GB
- Back-up memory size: 64GB

NA100-CR

Mini choke-ring multi-GNSS antenna

FEATURES

GNSS signal tracking

1540-1610 M

- L1: GPS / GLONASS / OmniStar / IRNSS
- B1: Beidou
- E1 / E2 / L: Galileo / QZSS

1164-1254 MHz

- L2 / L5: GPS / GLONASS / IRNSS
- B2 / B3: Beidou
- E5 / E6: Galileo

Antenna Characteristics

- 7inch diameter choke-ring(multipaht reduction)
- Jamming / interference protection
- Active GNSS antenna
- Diameter / height: 178 / 163mm
- Weight: 771g
- Operating / storage temp: -55 to 85℃ / -57 to 95℃
- Vibration: > 30G's
- Connector: TNC female

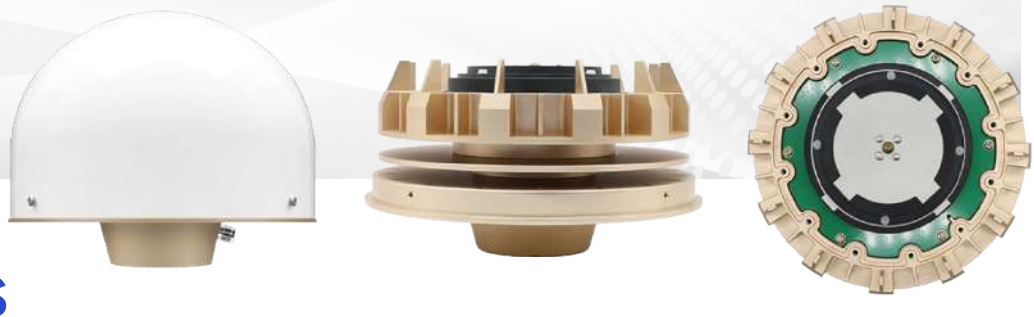
PERFORMANCE

Antenna Phase center

Frequency(GHz)	1.175	1.200	1.225	1.250	1.275	1.550	1.575	1.600
X offset(mm)	+0.27	-0.08	-0.30	+0.26	+0.86	0.00	+0.64	+1.30
Y offset(mm)	+2.17	+1.02	+0.14	-1.82	-2.67	+0.12	-0.58	-0.74
Z offset(mm)	+36.81	+36.81	+36.81	+36.81	+36.81	+36.81	+36.81	+36.81

NA200-CR

Mini choke-ring multi-GNSS antenna



FEATURES

GNSS signal tracking

- GPS: L1 / L2 / L5
- GLONASS: L1 / L2 / L3
- GALILEO: E1 / E5a / E5b / E6
- BDS: B1 / B2 / B3
- QZSS: L1 / L2 / L5 / L6
- IRNSS: L5
- SBAS: L1 / L5

Antenna Characteristics

- Mini choke-ring(multipaht reduction)
- Jamming / interference protection
- Active GNSS antenna
- Diameter / height: 185 / 148mm
- Weight: < 2.5Kg
- Operating / storage temp: -40 to 85℃ / -55 to 85℃
- Connector: TNC female

PERFORMANCE

Electrical

- Nomainal Impedance: 50Ω
- Polarization: RHCP
- Axial Ration: ≤ 3dB
- Azimuth Coverage: 360°
- Output VSWR: ≤ 2.0
- Peak Gain: 6.5dBi
- Phase Center Repeatability: ± 1mm
- LNA Gain: 50 ± 2dB
- Noise Figure: ≤ 2dB
- Passband Ripple: ± 2dB
- Operation Voltage: 3.3 to 12VDC
- Operation Current: ≤ 60mA
- Differential Propagation Delay: ≤ 5ns

Antenna Phase center

Frequency(GHz)	L1	L2
X offset(mm)	+0.19	-0.19
Y offset(mm)	-0.58	-0.28
Z offset(mm)	+96.44	+94.21

NA50

Survery multi-GNSS antenna

FEATURES

GNSS signal tracking

- GPS: L1 / L2 / L5
- GLONASS: L1 / L2 / L3
- GALILEO: E1 / E5a / E5b / E6
- BDS: B1 / B2 / B3
- QZSS: L1 / L2 / L5 / L6
- IRNSS: L5
- SBAS: L1 / L5

Antenna Characteristics

- High phase center stability
- Strong anti-interference performance
- Active GNSS antenna
- Diameter / height: 173.4 / 62.6mm
- Weight: < 0.5Kg
- Operating / storage temp: -40 to 85℃ / -55 to 85℃
- Connector: TNC female

PERFORMANCE

Electrical

- Nomainal Impedance: 50Ω
- Polarization: RHCP
- Axial Ration: ≤ 3dB
- Output VSWR: ≤ 2.0
- Peak Gain: 6.5dBi
- LNA Gain: 40dB
- Noise Figure: ≤ 2dB
- Operation Voltage: 3.3 to 12VDC
- Operation Current: ≤ 45mA
- Differential Propagation Delay: ≤ 5ns

Antenna Phase center

Frequency(GHz)	L1	L2
X offset(mm)	+0.3	+0.5
Y offset(mm)	+0.8	+0.3
Z offset(mm)	+57.7	+48.5

mmTR® NetVu

Web-Based GNSS Solution management System

FEATURES

Characteristics

Web server:

- Compatible with various web browsers
- Effective web service security
- Efficient database management
- Scalable for a number of clients

Certificate of Software Quality:

- Certification Mumber: 22-0236(Korea)
- Certification Level: GS, Level 1

NavSys's proprietary technologies

mIMS: mmTR® Information Management system

- An agent program that delivers GNSS solutions from application sites to mmTR® NetVu and clients
- mINS Server / Client · Connector: TNC female

Copyright Registration:

- Registration Number: C-2023-007921(Korea)

PERFORMANCE

GNSS data access

- Application sites: Registration
- Internet protocol(mIMS): UDP
- Data format: NavSys/NMEA-0183 or user defined

Service Security

- User management: Access level
- Site management: Project / location / station

DEVELOPMENT

Google Chrome

- Container: Docker 20.10.5
- DBMS: MySQL 8.0.22
- WebServer: Nginx 1.21.1
- OS: Windows10 Pro / Ubuntu 16.04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TECHNOLOGY INC
NavSys' outstanding technology pursues
daily safety and convenience.


NAVSYS
TECHNOLOGY INC
Bridge
Road
Railroad
roadbed
Autonomous
driving
Building
Drone
Navigation

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TECHNOLOGY INC

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