- ✓ Multi high precision GNSS and RTK support
- ✓ 6-axis IMU for positioning compensation
- ✓ Built-in 4G+GNSS antennas with IP68, easy to deploy
- ✓ 1-RS232(Debug), 1-RS485, 1-Pulse Input for diverse IoT sensors
- ✓ RTCM, RINEX protocols to improve the effectiveness and accuracy of GNSS
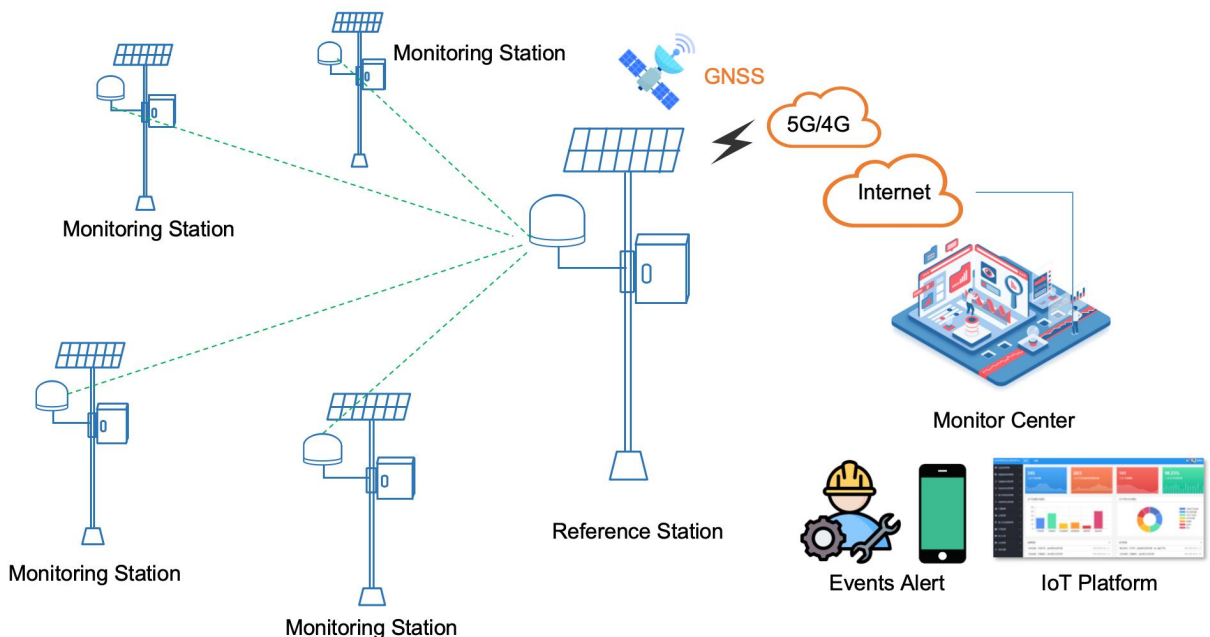
Introduction

The Bivocom TN531 is a state-of-the-art high-accuracy positioning solution designed to meet the rigorous demands of modern applications in structural health monitoring (SHM), deformation analysis, and disaster assessment. Packed with advanced features, this innovative device combines low power consumption with easy installation, ensuring seamless integration into a wide range of environments.

Equipped with built-in 4G connectivity and a GNSS antenna, the TN531 delivers reliable real-time data for effective monitoring. Its robust IP68 rating guarantees durability in harsh conditions, while the embedded MEMS tilt sensor and 6-axis inertial measurement unit (IMU) enhance positioning accuracy through effective compensation.

The TN531 supports real-time kinematic (RTK) positioning and adheres to industry standards such as RTCM and RINEX, making it an invaluable tool for applications in smart cities integration, geological disaster monitoring including tectonic movement detection, landslide monitoring, and volcanic activity, as well as flood monitoring. With features like 1x RS232, 1x RS485, and 1x pulse input, the TN531 offers versatile connectivity options, ensuring it meets the evolving needs of infrastructure and environmental monitoring.

Unlock the potential of precision monitoring with the Bivocom TN531, the perfect solution for enhancing safety and efficiency in urban and natural settings.

Diagram

Specifications

System

- **MCU** — Industrial 32-bit
- **Flash** — 512KB
- **SRAM** — 256KB
- **Data Storage Flash** — 16MB

GNSS

- **Antenna** — Built-in
- **GPS** — GPS L1C/A /L1C/L2C/ L5
- **BDS** — B1I/B2I/B1C/B2b/B2a/B3I
- **Galileo** — E1/E5a/ E5b
- **GLONASS** — G1/G2
- **QZSS** — L1C/A/L1C/L2C/ L5

Positioning Accuracy

- **Static Accuracy** — H: 2.5mm + 1ppm | V: 5mm + 1ppm
- **RTK Accuracy** — H: 8mm + 1ppm | V: 15mm + 1ppm
- **Cold /Hot Start** — ≤18s / ≤1s
- **initialization Time** — <5s
- **Initialization Reliability** — >99.9%
- **PPS Accuracy** — 20ns

Data Output

- **Data Format** — NMEA 0183 V4.1, RTCM3.X
- **Update Rate** — Up to 20Hz

MEMS IMU Sensor

- **6-Axis** — 3-axis gyroscope, 3-axis accelerometer for real-time compensated 3-axis attitude angles
- **Update Rate** — Up to 20Hz

Cellular Interfaces

- **Antenna** — Built-in
- **SIM Slot** — 1x Nano SIM
- **ESD Protection** — 15KV

Serial Interfaces

- **Ports** — 1-RS232(Debug), 1-RS485
- **Baud Rate** — 300bps to 230400bps
- **ESD protection** — 15KV

Pulse Input

- **Connector** — Terminal block, 3.5 mm female socket with lock
- **Pulse Input** — 1x PI (high level 5-35V)

Power Output

- **Port** — 1
  Default is 12V. rated output current is 1A, built in overcurrent protection

Power Input

- **Standard Power** — DC 12V/1.5A
- **Input Voltage** — 9-35 VDC
- **Communication** — 12V@145mA

Software

- **Network Protocols** — MQTT, Transparent (TCP Client/Server, UDP Client/Server), Modbus RTU
- **Management** — Config tool, SMS, Cloud DMP (Device Management Platform)[1]

Physical Characteristics

- **Ingress Protection** — IP68
- **Housing & Weight** — Aluminum alloy(base)+ABS/PC Cover, 1550g, without accessories
- **Dimensions** — φ200*150mm
- **Mounting** — Flange face, or pipe thread

Environmental

- **Operating Temperature** — -35°C to +75°C (-31°F to +167°F)
- **Storage Temperature** — -40°C to +80°C (-40°F to +176°F)
- **Relative Humidity** — 5% to 95% (non-condensing)

Others

- **LED Indicators** — System, Online, Power, Error
- **Built-in** — Watchdog, RTC, Timer
- **Approvals[2]** — CE*, RCM*, FCC*, NBTC*
- **Warranty Period[3]** — Standard: 12 Months
  Extended: 2-5 Years
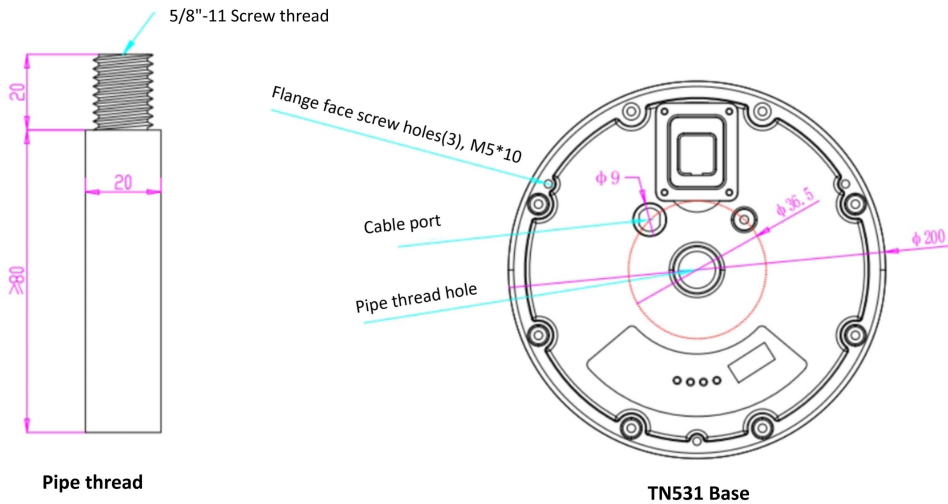
Standard Package Content

1. TN531 GNSS Receiver — 1 PCS
2. 4 IN 1 Cable(Power in/out, RS232, RS485, PI) — 1 PCS
3. Power cable — 1 PCS

Order Information

Model	Part Number	Description	Cellular Network	Frequency Band[4]
TN531-LF	TN531-L<1>	4G GNSS Receiver, 1-RS232(1 for debug), 1-RS485, 1-Pulse Input, 1-Power Output	4G LTE 3G/WCDMA/UMTS/HSPA+ EDGE/GPRS	4G LTE CAT 4 • EMEA/Asia: B1/B3/B5/B7/B8/B20/B38/B40/B41 • ANZ/LATAM: B1/B3/B5/B7/B8/B28 • NA: B2/B4/B5/B12/B13/B14

<1> means module for different cellular networks, countries and regions.

Dimensions

5/8"-11 Screw thread

20

20

≥80

Pipe thread

Flange face screw holes(3), M5*10

Cable port

Pipe thread hole

φ9

φ26.5

φ200

TN531 Base

Note:
1. There has a license fee for DMP.
2. * Under progress
3. Price of the extended warranty will be different.
4. If you couldn't find the frequency band for your regions or have any questions, please contact Bivocom sales representatives for more information.
5. To save the earth, Bivocom doesn't print the user guide, if you need it, please go to Bivocom website to download.
6. icon in this datasheet are from flaticon.

Unit 1402-2, No. 39, Xixi Shanwei Rd.,
3rd Software Park, Xiamen, China 361022
www.bivocom.com

© 2023 XIAMEN BIVOCOM TECHNOLOGIES CO., LTD. All rights reserved.
Spec and information are subject to change without any notice.
Version No.: 2.3.2 Updated: 07-31--2024

P: +86 158 8026 2905
E: sales@bivocom.com
Page 3/3