

INTERNET OF THINGS (IOT)/ AUTOMATIC DRIVING INTELLIGENT EQUIPMENT



ABOUT BWSENSING

BWSENSING, a national high-end enterprise specialising in the research, development, manufacturing, and sales of inertial attitude sensors founded in 2010. Its headquarters, in Binhu District, Wuxi, Jiangsu and we have branches in Beijing, Chengdu, Zhejiang, Muscat, Abu Dhabi and other places.

Core products include inertial navigation systems (INS), tilt sensors (Inclinometer), attitude heading reference systems (AHRS), electronic compasses, and fiber optic gyroscopes. Mainly used in smart equipment, autonomous driving, IoT, and other fields.



HIGH-TECH ENTERPRISE CERTIFICATE

JIANGSU PROVINCE SPECIALIZED, REFINED, INNOVATIVE ENTERPRISES

2018 WORLD IOT EXPO GOLD AWARD

IOT INNOVATION AND INTEGRATION DEMONSTRATION ENTERPRISE

INDUSTRIAL METROLOGY WORKSTATION

PKU NATIONAL KEY LABORATORY TECHNOLOGY TRANSFER BASE

PATENTS FOR INVENTIONS



6 NATIONAL-LEVEL TALENTS

973 CHIEF 1

PROFESSOR/
DOCTORAL FELLOW 5

10 MORE DOCTOR
DEGREE

OVER 50% OF R&D STAFF

Manufacturing capacity



High Speed Mounter



Flexible Production Line



Vibration System



Three-axis High-precision
Rotary Table



Temperature-controlled Turntable



High & Low Temperature
Compensation Chamber

INTELLIGENT EQUIPMENT

HIGH-PRECISION FIBER OPTIC INTEGRATED NAVIGATION SYSTEM GI4100

- North Seeking Accuracy: $\leq 0.3^\circ$ Secant Latitude $^\circ$
- Heading Accuracy: $\leq 0.008^\circ$
- Attitude Accuracy: $\leq 0.003^\circ$
- Gyroscope Range: $\pm 1000^\circ/\text{s}$
- Gyroscope Zero Bias Stability: $\leq 0.007^\circ/\text{h}$
- Size: L178mm $\times$ W180mm $\times$ H179.1(mm)
- Application: medium-range strategic missile guidance, radar antenna stability



3D HIGH-PRECISION ELECTRONIC COMPASS DMC5000

- Heading Accuracy: 0.3° (Horizontal)
 $< 0.5^\circ$ (Tilt $< 20^\circ$)
- Measuring Range: $0 \sim 360^\circ$
- Tilt Parameters: Pitch 0.2° , Roll 0.2°
- Size: L33 $\times$ W31 $\times$ H13.55(mm)
- Application: satellite tracking, individual combat equipment



HIGH-PERFORMANCE INERTIAL MEASUREMENT UNIT IMU600

- Gyro Resolution: $0.00003^\circ/\text{s}$
- Gyro Range: $\pm 300^\circ/\text{s}$
- Zero Bias Stability: $0.3^\circ/\text{h} \sim 15^\circ/\text{h}$ for optional
- Accelerometer Range: $\pm 20g$, (Optional $\pm 5g$, $\pm 50g$)
- Size: L44.8 $\times$ W38.6 $\times$ H21.5 (mm)
- Application: pipeline survey engineering, autonomous



SIX-AXIS HIGH-PRECISION ELECTRONIC COMPASS BMR3000

- Heading Accuracy: $\pm 0.2^\circ$ (horizontal use)
 $< 0.5^\circ$ (Pitch $< 30^\circ$)
- Resolution: 0.001°
- Tilt Range: Pitch 0.01° , Roll 0.01°
- Size: L107 $\times$ W38 $\times$ H25 (mm)
- Application: satellite tracking, oceanographic surveys



AXIS ANGLE SENSOR WF-WA500-DYN

- Measuring Range: $\pm 180^\circ$
- Resolution: 0.01°
- Accuracy: 0.03° (no installation error)
- Number of Output Axes: Single axis (Y)
- Output Frequency: $\leq 500\text{Hz}$
- Size: L100 $\times$ W60 $\times$ H30 (mm)
- Application: aircraft rudder measurement, construction machinery, wind tunnel testing



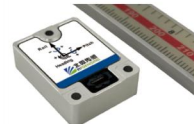
ULTRA-HIGH PRECISION DIGITAL DYNAMIC INCLINOMETER VG500C

- Dynamic Accuracy: 0.1°
- Static Accuracy: 0.01°
- Resolution: 0.001°
- Tilt Range: Pitch $+ 90^\circ$, Roll $+ 180^\circ$
- Maximum Output Frequency: 500Hz
- Size: L60 $\times$ W59 $\times$ H29(mm)
- Application: underwater unmanned boat



SMALL SIZE HIGH PRECISION ATTITUDE HEADING REFERENCE SYSTEM DMC630

- Measuring Range: $0 \sim 360^\circ$
- Heading Accuracy: 1°
- Gyroscope Range: $\pm 250^\circ/\text{s}$
- Tilt Range: pitch 0.2° , Roll 0.2°
- Size: L33 $\times$ W31 $\times$ H12(mm)
- Application: humanoid robots, handheld optoelectronic devices



DIGITAL DUAL AXIS INCLINOMETER BWM426

- Measuring Range: $\pm 90^\circ$
- Highest Accuracy: 0.01°
- Resolution: 0.001°
- Zero Bias: $\pm 0.005^\circ$
- Size: L90 $\times$ W40.5 $\times$ H26(mm)
- Application: industrial automatic leveling, equipment automation



MEMS ACCELEROMETER & GYRO CHIPS AS100 & GYRO100

- Bias Stability (typical): $0.1 \sim 0.5\text{mg}$
- Measuring Range: $\pm 5 \sim 100g$
- Partial Temperature Coefficient: $\pm 5 \sim 100\text{mg}/^\circ\text{C}$
- Zero Bias Stability: $\pm 0.5 \sim 10^\circ/\text{h}$
- Range: $100 \sim 10800^\circ/\text{s}$



CAN COMMUNICATION LOW-COST ATTITUDE REFERENCE SYSTEM BW-AH225

- Tilt Range: Pitch 0.5° , Roll 0.5°
- Heading Accuracy: 0.8°
- Resolution: $0.01^\circ/\text{s}$
- Gyro Measuring Range: $\pm 400^\circ/\text{s}$
- Size: L60 $\times$ W59 $\times$ H29(mm)
- Application: satellite tracking, robot control



AUTOMATIC DRIVING

MEMS-BASED GNSS/INS GI320

- Position Accuracy RTK: 0.8cm
- Heading Accuracy (with GNSS signal): 0.05° static / 0.1° dynamic
- Roll/Pitch (1σ) (with GNSS signal): 0.03° static / 0.1° dynamic
- Output Form: RS422/RS232
- Size: L116.5×W99.5×H30(mm)



ULTRA-COMPACT INERTIAL MEASUREMENT UNIT IMU100S



- Gyro Range: $\pm 500^\circ/\text{s}$
- Accelerometer Range X,Y,Z: $\pm 10\text{ g}$
- Gyro Zero Deviation: $\leq 150^\circ/\text{h}$
- Accelerometer Zero Bias Stability (1σ): $\leq 0.3\text{mg}$
- Operating Temperature Range: $-40^\circ\text{C} \sim +85^\circ\text{C}$
- Size: L22.4×W22.4×H10(mm)
- Application: low-speed drones, unmanned vehicles

MULTI-REDUNDANT DYNAMIC INCLINATION SENSORS BW-VG55R

- Gyroscope Range: $\pm 500^\circ/\text{s}$
- Resolution: 0.01°
- Static Accuracy: 0.1°
- Dynamic Accuracy: 1°
- Tilt Range: pitch $\pm 80^\circ$, Roll $\pm 180^\circ$
- Size: L70×W80×H27.9(mm)
- Application: vehicle chassis attitude, intelligent excavators



COST-EFFECTIVE CAN BUS DYNAMIC INCLINATION SENSOR BW-VG225E



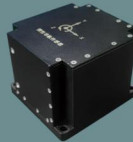
- Dynamic Accuracy: 0.5°
- Static Accuracy: 0.01°
- Resolution: 0.01°
- Tilt Range: Pitch $\pm 90^\circ$, Roll $\pm 180^\circ$
- High Level EMC Protection
- Size: L97×W63×H27.2(mm)
- Application: special vehicles, body attitude

COST-EFFECTIVE SINGLE AXIS FIBER OPTIC GYROSCOPE AgileLight-60A

- Measuring Range: $\pm 530^\circ/\text{s}$
- Zero Bias Stability: $\leq 0.1^\circ/\text{h}$
- Resolution: 0.06°/h
- Relative Error of Scale Factor: $\leq 100\text{ppm}$
- Power Consumption: $\leq 4\text{W}$
- Size: $\Phi 59.6 \times H26.3(\text{mm})$
- Application: UAV, motion attitude control



THREE-AXIS INTEGRATED FIBRE-OPTIC GYRO AgileLight-40C



- Measuring Range: $\pm 890^\circ/\text{s}$
- Zero-bias Stability: $\leq 0.3^\circ/\text{h}$
- Resolution: 0.15°/h
- Relative Error of Scale Factor: $\leq 200\text{ppm}$
- Working Temperature: $-45^\circ\text{C} \sim +70^\circ\text{C}$
- Size: L65×W70×H51(mm)
- Application: UAV, low orbit satellites

SEVEN-AXIS COMBINED NAVIGATION MICROSYSTEM BW-GIP200

- Gyro Bias Instability: 5°/h
- Gyro Full-temperature Bias: 0.3°/s
- Accelerometer Range: $\pm 16\text{g}$
- Accelerometer Bias Instability: 50μg
- Accelerometer Full-temperature Bias: 5mg
- LGA80 Package: L25×W24.4×H2(mm)
- Application: autonomous driving



HIGH PRECISION 3-AXIS FIBER OPTIC GYRO INERTIAL MEASUREMENT UNIT BW-IMU1200



- Measuring Range: $\pm 1000^\circ/\text{s}$
- Stability of Normal Temperature Bias: $\leq 0.05\text{mg}$ (quartz)
- Dosing Range: $\pm 10\text{g}$
- Zero Bias Stability: $\leq 0.007^\circ/\text{h}$
- Size: L178×W180×H179.1(mm)

LOW COST MINS BW-MINS55

- Dynamic Accuracy: 3°
- Static Accuracy: 0.1°
- Measuring Range: Pitch $\pm 90^\circ$, Roll $\pm 180^\circ$
- Gyroscope Resolution: 0.01°/s
- Accelerometer Range(X/Y/Z): $\pm 2\text{g}$
- Size: L55×W37×H24(mm)
- Application: AGV small robot



FLIGHT CONTROL INTEGRATED NAVIGATION MODULE BW-GI200



- Gyroscope Range: Up to $\pm 4000\text{ dps}$
- Bias Stability: 15°/h (10s, 1σ)
- Accelerometer Range: Up to $\pm 16\text{g}$
- Bias Stability: 0.3mg (10s, 1σ)
- Magnetometer Nonlinearity: $\pm 0.5\%$
- Size: L43.1×W39.6×H10.8(mm)
- Application: various aircraft

INTERNET OF THINGS (IOT)

RUDDER MEASURING SYSTEM

- Measuring Range: $\pm 180^\circ$
- Resolution: 0.01°
- Working Temp: $-40^\circ\text{C} \sim +85^\circ\text{C}$
- Measuring Axis Accuracy:
0.03° (without installation error)
0.1° (with installation error)
- Application: shaft angle test



DIGITAL DUAL-AXIS INCLINOMETER BWK226S



- Resolution: 0.02°
- Accuracy: 0.2°
- Zero Deviation: $< 0.05\% \text{FS}$
- Measuring Range: $+90^\circ$
- IP67 protection
- RS232/485/TTL optional

DIGITAL DUAL-AXIS INCLINOMETER BWM466

- Measuring Range: $\pm 90^\circ$
- Accuracy: 0.01°
- High Vibration Resistance: $> 2000g$
- Resolution: 0.001°
- PCBA Size: $L67 \times W20 \times H8(\text{mm})$



DIGITAL DUAL AXIS INCLINOMETER BWM426S



- Resolution: 0.001°
- Accuracy: 0.01°
- Measuring Range: $\pm 90^\circ$
- Zero Bias: $\pm 0.005^\circ$
- Output: RS232/RS485/TTL optional
- Size: $L55 \times W37 \times H24(\text{mm})$

PRESSURE SCANNING VALVE BW-PS8D/16D/32D/64D

- Accuracy: $0.025\% \text{FS} - 0.1\% \text{FS}$
- Pressure differential: $7\text{KPa} - 120\text{KPa}$
- Static Pressure Characteristics: $\leq 0.03\% \text{FS}/10\text{MPa}$
- Size: $L84.9 \times W42 \times H41.6(\text{mm})$
- High long-term stability
- IP66



SUPER HIGH-ACCURACY DIGITAL OUTPUT DUAL-AXIS INCLINOMETER BWS2000



- High Accuracy: 0.001°
- Cross Axis Error: 0.001°
- IP67 Protection Level
- Resolution: 0.0005°
- RS485/232/TTL Optional
- Size: $L103.8 \times W55.4 \times H26(\text{mm})$

LORAWAN WIRELESS HIGH ACCURACY TRIAXIAL TILTMETER / INCLINOMETER LWHD-WM400

- Resolution: 0.001°
- Accuracy: 0.005°
- Measuring Range: $\pm 60^\circ$
- Can be used for up to 10 years
- Magnetic Switch



PROFESSIONAL HANDHELD THERMAL IMAGING CAMERAS BW-HA-384



- Resolution: 384×288
- Thermal Sensitivity (NETD): $\leq 50\text{mK}@25^\circ\text{C}$
- Frame: 30Hz
- Digital Zoom: 1x-8x (rounded)
- Temperature Range: -20 to 600°C
- Size: $L275 \times W123 \times H130(\text{mm})$

DISPLACEMENT SENSOR SDVB20Z

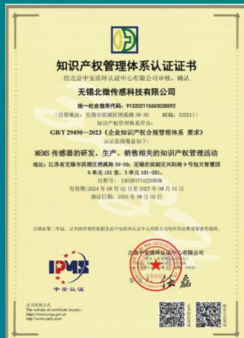
- Displacement Range: 10 mm, 25 mm, 50 mm, 100 mm
- Linearity Error: $\pm 0.5\%$
- Resolution: $\leq 0.1\mu\text{m}$ (maximum)
- Digital Output: 16 bit
- Operating Temperature: $-25^\circ\text{C} \sim +85^\circ\text{C}$
- Temperature Coefficient: Zero $\leq 0.01\%/^\circ\text{C}$
- Sensitivity $\leq 0.025\%/^\circ\text{C}$



NETWORK HD INFRARED DUAL-SPECTRUM PTZ CAMERA BW-HP2-NH



- Pixel: 2 million pixels
- Resolution: $1920(\text{H}) \times 1080(\text{V})$
- Horizontal Angle: 360° continuous
- Vertical Angle: $-90^\circ \sim 90^\circ$
- Smart Analysis: Perimeter detection, trip wire detection, face detection, snapshot
- Product size: $\Phi 370 \times 202(\text{mm})$



CERTIFICATION OF INTELLECTUAL
PROPERTY MANAGEMENT SYSTEM



PRODUCT ACCURACY
INSPECTION REPORT



CE/RoSH



TEMPERATURE TEST REPORT



SOCIAL RESPONSIBILITY ASSESSMENT REPORT



CHINA MEMS
STANDARD DRAFT



CHINA MEMS
STANDARD DRAFT



ISO26262



ISO14001



ISO9001



ISO45001



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