

## Cost-effective dual axis inclination sensor : BWM826-30-485

The Ministry of Housing and Urban-Rural Development defines the "Guidelines for Construction Safety Supervision and Management of Construction Projects High Formwork Support System" : The tall formwork support system refers to the height of the concrete member formwork support construction site on the construction site exceeds 8m, or the span exceeds 18m, or the total construction load A formwork support system with a load greater than 15kN/ m<sup>2</sup> or a concentrated line load greater than 20kN/m; a high formwork means a formwork with a height greater than or equal to 4.5m and its supporting system; a high-support form safety accident is mainly caused by excessively large or deformed high-supported formwork Excessively induced failure of the steel components in the system, local collapse of the high-span form or overall overturning, resulting in casualties.



The high-module real-time monitoring and alarm system hardware and equipment developed by Beiwei Sensing Partner Wuhan Zhongyan Technology Co., Ltd. has four parameters: high-module formwork settlement, vertical axis force, member inclination angle, and overall horizontal displacement of the bracket. High-frequency automatic acquisition, real-time wireless transmission, data processing analysis and live sound and light alarm function, using high-frequency sampling to achieve real-time continuous monitoring, live sound and light alarm, second-pole response, automatic trigger mechanism for real-time alarm and on-site alarm, reminder operation Personnel evacuate dangerous areas in an emergency, effectively reducing construction safety risks.



Product real shot

### Product Highlights:

- Roll and pitch accuracy up to 0.005°
- Resolution up to 0.0007
- Biaxial inclination measurement with small cross error
- Real-time monitoring of high-module geometry deformation
- High degree of automation, unattended
- More implementation cases and better results
- High data stability and minimal temperature drift
- Easy to install sensors, shorten construction time
- Small size, light weight and long life
- IP67 protection for outdoor installation
- High-frequency sampling for real-time continuous monitoring, live sound and light alarm

## Cost-effective dual axis inclination sensor-Technical indicators

### Mechanical Characteristic

Connector	lead (standard cable is 1.5m)
Protection level	IP67
Shell material	Magnesium alloy anodizing
Installation	Four M4 screws

### Electrical Specifications

Parameters	Conditions	Min	Typical	Max	Units
Power supply		10	12	35	V
Operating current	Non-loaded	20	30	40	mA
Operating temperature		-40	25	+85	°C
Store temperature		-55	25	+100	°C

### Performance Specifications

Parameters	Conditions	BWM826-5	BWM826-15	BWM826-30	Units
Measuring range		±5	±15	±30	°
Measuring axis		X-Y	X-Y	X-Y	
Accuracy	Indoor	0.005	0.008	0.01	°
Resolution		0.002	0.002	0.002	°
Zero temperature drift	-40~85°C	±0.001	±0.001	±0.001	°/°C
Sensitivity error	25°C	±0.5	±0.5	±0.5	%
Frequency response		100	100	100	Hz
Cross sensitivity		3	3	3	%
MTBF	≥90000 hours/time				
Electromagnetic compatibility	according to GBT17626				
Insulation resistance	≥100 MΩ				
Shock resistance	2000g,0.5ms,3times/axis				
Weight (g)	150(package excluded)				

## Cost-effective dual axis inclination sensor-Success case

### System Overview

Product development is based on the following :

1. Construction Management Safety Regulations;
2. "Safety Technical Specification for Portal Steel Pipe Scaffolding for Building Construction" JGJ128-2000;
3. "Code for Design of Wood Structures" GB5 0005-2003;
4. "Construction Quality Acceptance Specification for Concrete Structure Engineering" 50204-2002;
5. "Uniform Standard for Construction Quality Acceptance of Construction Engineering" GB50300-2001;
6. "Building Construction Calculation Manual" (ISBN-7-11-04626-2 edited by Jiang Zhengrong).

The names of the supporting products involved in the high-profile instrumentation are shown in the following table:

High-module monitoring system components (high with)		
equipment name	Instrument model	Standard quantity
High-module multi-channel wireless acquisition instrument	RSM-WAS	1
High mode wireless collector	RSM-WAS (L)	34
Pull line displacement meter	RSM-SLJ (L)	16
High precision inclinometer	RSM-QJS100	8
Pressure Sensor	RSM-FHJ	8
Audible alarm	RSM-SLA	2
High modulus monitoring system	RSM-MPS (G)	1
Instrument sensor case	custom made	5

### Main characteristics

- 1) Powerful, stable and durable, friendly interface, easy to carry, easy to connect on site.
- 2) High degree of automation, unattended operation, automatic recovery of acquisition functions in case of power failure, and real-time manual control.
- 3) The computer and the collector are connected to communicate to support the wireless and wired mode. The communication mode of the uploading platform of the collector is 3G/4G.
- 4) The high-mode wireless collector is set up in a wireless ad hoc network to support automatic wireless upload after power off or power off.

## Cost-effective dual axis inclination sensor-Success case

5) Realize remote monitoring of cloud platform system.

6) Supporting the use of 433 wireless communication module and PC upper computer operation software, it can carry out wireless parameter setting of data and analysis of data transmitted on site.

7) The instrument has high precision and good reliability.

8) Compatible, compatible with RSM-QJS1000 high-precision inclinometer inclinometer, RSM-SLJ (L) cable displacement meter and RSM-FHJ load pressure sensor wireless data acquisition, RSM-WAS high-module multi-channel wireless acquisition instrument can simultaneously Connect 32 different types of sensors.

9) There is no delay in the on-site alarm response.

10) Multiple power supply modes: built-in lithium battery and external 220V AC power supply, built-in lithium battery can support continuous acquisition for 24 hours; support long-term live use; support solar panel power supply for harsh areas.

11) Data capacity: Built-in 16G memory card, can support 1 million groups. Support data to directly capture and save U disk.

### RSM-WAS High-module multi-channel wireless acquisition instrument



#### Product index :

Model	RSM-WAS
Sampling method	Fixed point scan acquisition
Display mode	External PC display
Storage mode	External U disk or PC capture storage
Communication method	Built-in wired and wireless communication, 3G/4G wireless transmission
Sensor supply voltage	+12V
External supply voltage	+12V
Measurable sensor type	High-precision inclinometer, cable displacement meter, load pressure gauge

## Cost-effective dual axis inclination sensor-Success case

Number of sensors that can be mounted	32
Sampling interval	≥1S
Range	±30° (high-precision inclinometer), 1000mm (wire tension meter), 50KN (load pressure gauge)
Measurement accuracy	0.005 (inclinometer), 0.1mm (wire tension meter), 0.05% FS (load pressure gauge)
Temperature error	0.1°C
Number of channels	32 channel
Data transmission mode	Wireless transmission
Operating temperature	-20°C~55°C
Power supply mode	Built-in lithium battery ≥ 24 hours or external power supply for long-term work
Shell	Full metal casing; matching waterproof box for long-term use
Interface	USB2.0
Volume	13.5cm×8.8cm×6cm
Weight	1.0kg ( Lithium-containing battery )

## RSM-WAS ( L ) High mode wireless collector



### Product index :

Model	RSM-WAS ( L )
Transfer method	Free application band wireless transmission
Transmission distance	The distance from the open space is about 4000 meters.

## Cost-effective dual axis inclination sensor-Success case

Sensitivity	Up to -126dBm
Error correction coding capability	Support for maximum error correction 64bit
Power supply	Lithium battery power supply or external adapter power supply
Internal power supply	+12V
Internal battery working time	≥48H
Sampling interval	≤1HZ
Operating temperature	-10°C to +60°C
Protection level	IP65

### RSM-QJS100 Inclinometer



#### Product index :

Voltage	9-36VDC
Current consumption	50mA (12V)
Operating temperature	- 40~ + 85°C
Storage temperature	- 45~ + 90°C
Connector	Waterproof air socket or direct lead (1.5M)
Shell material	Aluminum alloy oxidation
Impact resistance	20000g, 0.5ms, 3Times/Axis
Weight	240g



## Cost-effective dual axis inclination sensor-Success case

### RSM-SLJ(L) wire-type displacement meter



#### Product index :

Model	RSM-SLJ(L)
Standard range (mm)	0 ~ 1000mm
Minimum reading (mm)	0.1
System error (mm)	$\leq 0.2$
Steel ruler tension (Kg)	8
Temperature correction system (mm / °C)	$12 \times 10^{-6}$
Instrument weight (Kg)	1.8

### RSM-FHJ Pressure sensor



## Cost-effective dual axis inclination sensor-Success case

### Product index :

Model	RSM-FHJ
Material	alloy steel
Rated load	50KN
Standard range	0 ~ 50KN
Precision	0.05%FS
Zero output	±1%FS
Enclosure rating	IP67
Operating temperature	-20 ~ 65°C

### RSM-SLA Audible alarm



120 high-decibel sound and light alarm (left custom original) and 90 low-decibel multi-color alarm warning light (right optional)

### Product index :

Model	RSM-SLA
Material	Alloy steel shell + tempered glass cover
Operating Voltage	DC24V
Sound intensity	120 dB
Enclosure rating	IP65
type of light source	Red rotatable LED light
Explosion-proof grade	EXD BT6
product weight	2.46KG