



ROAD WEATHER STATION

Introduction

The integrated road weather station features its core advantage of integrating four key sensors to realize full-dimensional collaborative monitoring of meteorological environment, road surface conditions and visibility conditions. It synchronously collects and uniformly outputs data, meeting precise monitoring demands for multiple scenarios including transportation and municipal engineering.

Functions

Multi-parameter Ultrasonic Meteorological Sensor
Road Surface Condition Sensor
Visibility Meter
Rain & Fog Disdrometer

Advantages

Accurate monitoring
Integrated all-in-one assembly
Data visualization platform
Stable data transmission guarantee



Description

Road Surface Condition Sensor

Monitored items:

Road surface temperature,
humidity,
water film thickness,
ice thickness,
snow density
and friction coefficient (BPN value)

Ultrasonic Meteorological Sensor

Visibility Meter

Monitored items:
Atmospheric visibility,
covering fog,
haze,
dust storms, etc.

Rain & Fog Disdrometer

Electrical Control Box

Waterproof Internal Pole Wiring

Steel Pole

Wind-resistant Base

Ultrasonic Meteorological Sensor

12 Meteorological Elements

Wind speed, wind direction, temperature, humidity, air pressure, optical rainfall, PM2.5, PM10, CO, NO2, SO2, O23



Inverted Ultrasonic Transducer Design

Dust-proof and waterproof, no on-site manual maintenance required, free from rain and snow interference



Bottom Clamp Mount



Accessory

Four Installation Methods



1. Pole-clamp Crossbeam Bracket



2. Vertical Pole Adapter



3. Special Crossarm for Weather Station Pole



4. Pole-top Clamp Mount

Road Surface Condition Sensor

The ZCYL-ROAD series non-contact road surface condition sensor adopts remote sensing technology, which avoids road surface damage and eliminates traffic interference caused by road weather station installation. Multi-spectrum measurement technology enables accurate detection of road surface ice, snow and water film status & thickness.

Specifications



Item	Description
Measuring Principle	Remote sensing + multi-spectrum measurement
Installation Angle	30–80° relative to horizontal line
Detection Distance	2.8 meters
Diameter of Detection Area	23 cm
Power Supply	DC 12–24V
Power Consumption	2W

Parameter Accuracy

Monitoring Parameter	Description
Road Surface Temperature	Basic measurement; expandable range: -40°C ~ +60°C
Road Surface Humidity	Reflect surface dampness level
Water Film Depth	Measuring range: 0–10 mm
Ice Thickness	Measuring range: 0–2 mm
Snow Thickness	Measuring range: 0–2 mm
Friction Coefficient (BPN)	Range: 0.01 (slippery) ~ 0.82 (high friction)
Road Surface Status	Recognize 6 states: dry, damp, wet, snow, ice, ice-water mixture

Rain & Fog Disdrometer

The disdrometer is a precipitation monitoring device based on optical imaging. By analyzing size distribution and quantity density of raindrops and fog droplets, it accurately identifies precipitation type, rainfall intensity and cumulative rainfall, supplying refined precipitation data for meteorological early warning and traffic management.

Specifications



Item	Description
Model	ZCYL-DP
Measuring Principle	Optical imaging; high-speed camera captures drop images for spectrum analysis
Power Supply	DC 12–24V
Data Output	RS485 (Modbus); optional Ethernet
Operating Temperature	-40°C ~ +60°C
Operating Humidity	0–100% (non-condensing)
Protection Grade	IP65–IP67 customizable
Installation	Pole mounting (for meteorological stations, traffic monitoring poles)
Overall Dimension	Approx. 400×200×100 mm (excluding mounting parts)

Parameter Accuracy

Monitoring Parameter	Description
Precipitation Type	Recognize rain, snow, sleet, hail, fog; identification accuracy ≥95%
Raindrop Spectrum Distribution	Detect raindrop diameter 0.1–8 mm; count quantity and volume proportion of each size
Rainfall Intensity	Range: 0–200 mm/h, accuracy ±5%
Cumulative Rainfall	Calculated by intensity & duration, accuracy ±2%
Precipitation Particle Velocity	Measure falling speed to assist analysis of precipitation impact on roads & crops
Fog Droplet Spectrum Distribution	Detect fog droplet diameter 0.01–0.5 mm; count quantity and volume proportion
Precipitation Duration	Record start, end and lasting time of each precipitation event