HY-SLV2E

Visibility Sensor

User Manual

HONGYUV

Chapter 1
About this manual

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Safety

HY-SLV2E visibility sensor emits invisible light, comply to international standard IEC/EN 60825-1, and classified as Class 1 laser device. It means under any reasonably predictable operating conditions, HY-SLV2E is safe for eyes.

ESD Protection

Electrostatic Discharge (ESD) can cause immediate or latent damage to electronic circuits. Hongyuv products are adequately protected against ESD for their intended use. However, it is possible to damage the product by delivering electrostatic discharges when touching, removing, or inserting any objects inside the equipment housing. To make sure you are not delivering high static voltages yourself, take the following precautions:
- Handle ESD sensitive components on a properly grounded and protected ESD workbench. When this is not possible, ground yourself to the equipment chassis before touching the boards. Ground yourself with a wrist strap and a resistive connection cord. When neither of the above is possible, touch a conductive part of the equipment chassis with your other hand before touching the boards. - Always hold the boards by the edges and avoid touching the component contacts.

Warranty

For certain products Hongyuv normally gives a limited one-year warranty. Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or conditions of sale for details of the warranty for each product.

Technical Support

You can contact Hongyuv for any technical problems

Disclaimer

In no event shall Hongyuv be liable for any direct, indirect or consequential damages, including but not limited to, sales, business, profits or other financial losses, data loss, loss of use of other equipment, loss of goodwill, vehicles or personnel losses, should not be held responsible.

Although the performance of Hongyuv Technology Road Visibility Detector is reliable, failures that occur in the form of missing data or data inaccuracies are also likely to occur.

Hongyue is not responsible for problems caused by wrong installation, assembly, service or maintenance by personnel not authorized by Hongyuv or due to neglect of service and maintenance.

Chapter 2

PRODUCT OVERVIEW

Introduction

HY-SLV2E visibility sensor is working based on forward scattering principle developed by Hongyuv, it has integrated body, robust, lightweight and compact. Can also be mounted to vehicle for mobile monitoring. Aluminum alloy shell with spray-powder make it will never rust, applicable to drilling platforms, ships, highways and other transport sector.

The visibility meter adopts light forward scattering principle, built-in microprocessor-controlled atmospheric visibility monitoring equipment. It emits pulses of infrared light and measures the intensity of the forward-scattered light of the suspended particles in the atmosphere, using suitable algorithms to convert the measurements to meteorological visibility values.

Measure Range and Accuracy

a) Range: $10 - 3000$m

b) Accuracy: ±20%

Main Features

a）Continuous monitoring of atmosphere's visibility

b）Communicate with PC via RS485 or RS232

c）Powered by DC12-24V

Dimension and Weight

a）Dimension: 300mm×115mm×140mm；

b）Weight: <1.8kg

Visibility Sensor is compose of following modules:

a）Emitting Module;

b）Receiving Module;

c）Control Module

Chapter 3

Working Principle

When HY-SLV2E is working, emitting module emits a bunch of infrared light with a center wavelength of 0.87μm through the infrared light emitting diode to the atmosphere, and the receiver converges a certain volume of atmospheric forward-scattered light onto the receiving surface of the silicon photoelectric sensor and converts strength of light to electrical signal, then signal is processed and collected by DAM(Data Acquisition Module), and then processed as visibility values by CPU and sent to PC via RS485.

Fig 1   HY-SLV2E visibility outlooking

Safety Notice

- Do not let HY-SLV2E working under circumstance out of its operating condition.

- Read this manual carefully before using it, and strictly following guidance written in this manual.

- Component replacement or internal adjustments must be made by qualified maintenance personnel. Operating personnel must not remove instrument covers.

- The power should be turn off when wiring or connecting cables.

- Do not operate in an explosive atmosphere.

- Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

- Keep away from live circuits.

- Do not substitute parts or modify the instrument.

- Ground the product, and verify outdoor installation grounding periodically to minimize shock hazard

- In order to make sure that measured value can represent meteorological conditions of environment around, the installation location should far away from from large buildings or other facilities to

produce heat and prevent rainfall at least 100 meters and also avoid affection by shade of tree effect; the site shall be no interference optical measurement barrier, reflector and a significant source of pollution; installation direction of instrument should avoid direct sunshine on the receiver's perspective range.

Chapter 4

HY-SLV2E visibility sensor working condition

Power

    a) DC: $12-24$V

    b) Power consumption: <6W

Operating Condition

    a) Temperature: $-45-60℃$

    b) Relative humidity: $0-100\%$

    c) Air pressure: ≥650hPa

Storage Condition

    a) Environment temperature: $-50-70℃$

    b) Relative humidity: $0-100\%$

Chapter 5

Installation

It's very important to investigate installation site before you conduct installation, following steps are recommended to optimize performance of our sensor

1. Surveying the site:

- Find the most representative measurement site.

- Determine orientation of the Visibility Sensor.

2. Check the power supply and communication cable's layout.

Make sure ground wire, power supply wire, communication wire are sufficient.

3. Install HY-SLV2E on mounting pole

4. Connect power cable, communication cable and ground cable to electric control box, and connect sensor to PC/data logger.

Definition of cable:

Red: DC12-24V power supply +

Black：DC12-24V Power supply -

Yellow：RS485 output DA terminal

Green：RS485 output DB terminal

5. Turn on power and start measuring

Orientation and location

Basic requirement of installation:

a) To make sure the measured value can represent weather condition nearby, the ideal installation place should be at least 10 meters away from trees or construction that can create heating, shady or influence rain.

b) Make sure there isn't light contamination or air pollutant that will affect measurement.

c) Avoid the receiver exposed under direct sunshine, the orientation of sensor therefore should be north-oriented in the northern hemisphere, vice versa.

Installation Sketch：

Maintenance

The lens protection window of the visibility meter should be kept clean for accurate measurements, and the visibility values measured when the window is dirty will be high. Normally, the window should be cleaned every three month, but cleaning should be more frequent in some places, such as highways, seaside boats, ships, etc., and windy and dusty areas. Check the protective cover and window glass should be non-condensing water or ice and snow, remove the protective cover dust on the outside and inside.

Wipe the window glass with a soft, lint-free cloth or cotton and ethanol, taking care not to scratch the glass surface.

Trouble Shooting

PC is not receiving any data:

a) Check serial port setting of PC(Baud Rate, structure of data frame)

b) Check if the sensor is powered on

c) Contact manufacturer

Visibility value is obviously too high

Many reasons can result in this error. Mostly it's caused by block of light path between emitting and receiving module.

a) Lens protection window is dirty, clean it.

b) There is blockage on protective cover, remove it.

c) Contact manufacturer

Visibility value is obviously too low

a) Something interferes with sampling, checking for the presence of branches, cobwebs, etc. in or near the sample space.

b) Contact manufacturer