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Specification

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information

X-D1000 Technical specification

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X-D1000 Technical specification

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X-D1000 Technical specification

1. Product overview

X-D1000 is an industrial camera product based on 3D iTOF (indirect Time-of-Flight) technology solution, that is, the sensor emits modulated near-infrared light, reflected by the object, the sensor by calculating the phase difference between the light emission and the reflection, and then converted into the time difference, to calculate the distance of the photographed scene, to produce depth information. Finally, the three-dimensional contour of the object is presented in a topographic map with different colors representing different distances. Products can be widely used in industrial measurement, consumer electronics and other fields that require 3 D images.

The technical solution of the product can provide high precision (millimeter) depth map and 3 D point cloud map, integrated RGB (optional) X-D1000 camera to output pixel aligned RGBD image; can provide customer full platform SDK, Support / Windows / Linux (PC or ARM) / ROS system, can meet different industry applications.

Product X-D1000 Features:

- . Large field of view, small blind area;
- . Far distance, high precision;
- . Self-research of high-precision calibration, calibration algorithm;
- . Anti-ambient light, multi-road, muti-mech interference algorithm;

. Post-processing algorithm: denoising, eliminate float point and motion artifacts;

2. Specification and parameters

2.1. Product physical diagram

Product X-D1000 is as in the picture below:



Figure 1. X-D1000 frontal view



Figure 2. Side view of the X-D1000

2.2., Product specification

The relevant specification parameters of the product X-D1000 are as follows:

Table 1. Product specification table

name	performance index	Indicator parameters	remarks
system parameter	work environment	Indoor & Outdoor	

	Anti-strong light grade	100KLux	
	working temperature	-20°C ~ 60°C	
	security classification	CLASS 1	
	levels of protection	IP 67	
	structure size	84mm x 73mm x 35mm	
External interface	internet access	TOF data: depth map, point cloud map, RAW map, RGBD merging data	SelectConfiguration according to Users demand
	USB2.0		
	Power	24V / 5A	External synchronous CAN pass letter
TOF	resolution ratio	640 x 480 / 320 x 240	
	frame frequency	640 x 480@5fps / 320 x 240@20fps	
	range	0.2 ~ 10m@10% reflectivity	
	accuracy	0.5%@1.5m	
	FOV	105° x 75°	
	wavelength	940nm	
RGB	resolution ratio	1920 x 1080@20fps	SelectConfiguration according to Users demand
	UVC	support	
	FOV	84° x 60°	
	Shutter mode	Curtain shutter	
	ISP function	HDR 、 EV	
SOC	operating system	Windows / Linux / ROS	

	algorithm SDK	Preprocessing: calibration algorithm, depth calculation algorithm, etc.; Post-processing: filtering algorithm, point cloud conversion, automatic Exposure, etc.;	
	Parameters can be set	Resolution, frame rate, Exposure time, confidence, etc	

3. Structure description and interface

3.1., Structural drawings

The structure diagram of the product X-D1000 is shown as follows:

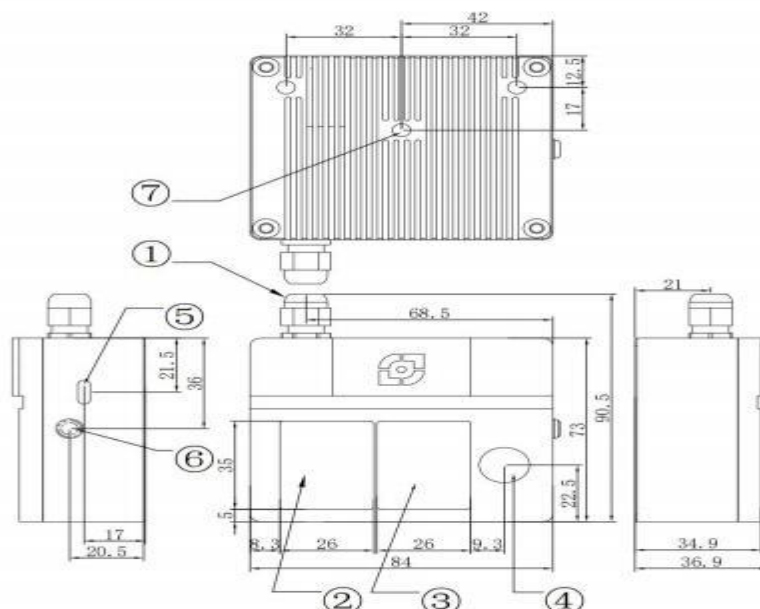


Figure 3. X-D1000 structure diagram in Fig

Note (in mm):

1 Power supply and network communication outlet;

2 Vcsel top protective glass;

- 3 Sensor top the protective glass;
- 4 RGB module top protective glass;
- 5. Type-C interface;
- 6. Status indicator light;
- 7 Mounting hole (three in total), thread size 1 / 4-20,4mm deep.

3.2. Hardware interface definition

The product hardware interface structure diagram is shown as follows:



Figure 4. Product interface diagram

The corresponding interface specification parameters in the product interface diagram are shown in the table below:

Table 2. Interface specifications

Interface	Number	output
hardware interface	①	One hundred trillion net
	②	DC5521 Power supply input

(Note: Other interfaces, such as external synchronization, input and output interface is optional.)

3.3. Accessories

Adapter: 24V / 5A;

Adapter interface: DC5521 male

3.4. Connection schematic diagram

The connection diagram of product X-D1000 is as follows:

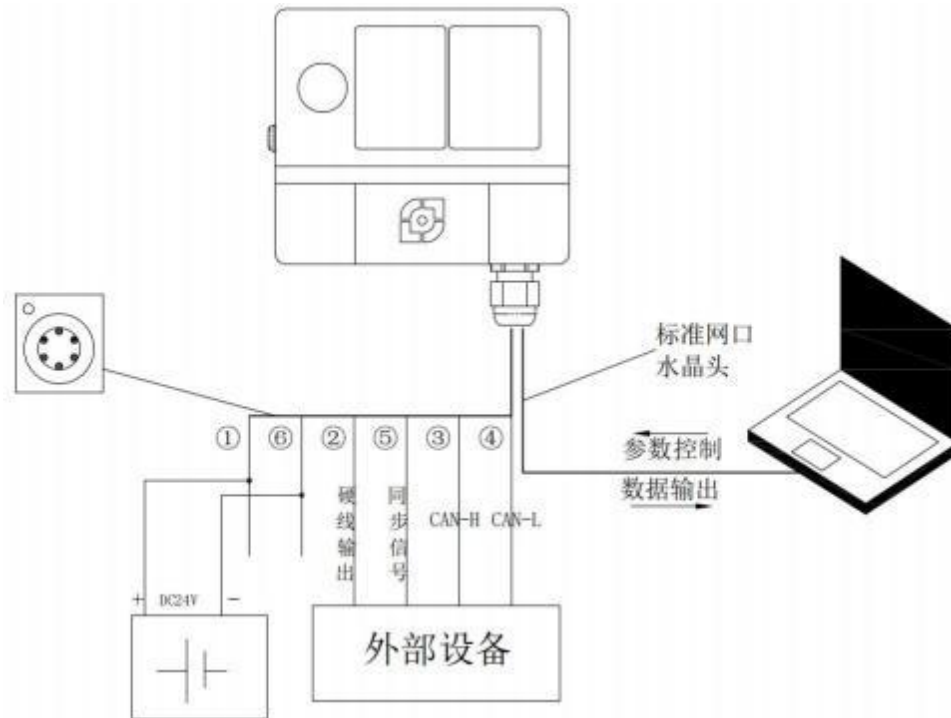
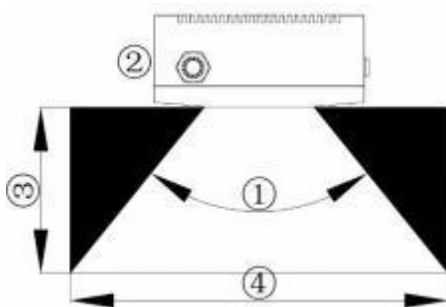


Figure 5. Schematic diagram of the product connection

3.5., Installation instructions



1 Field of view angle

2 The camera

3 Distance between the camera and the target

4 The field of view

installation place:

Following are instructions for installation location selection:

- (1) The target object must be completely within the field of view ④;
- (2) When installing and positioning, please consider the tolerance;

- (3) The distance between the camera and the target is the value of the maximum measurement range, please refer to it when in actual use;
- (4) The smaller the ③ value, the higher the accuracy;
- (5) When choosing the installation position, consider maintaining the cleanliness of the external lens of the camera;
- (6) In the object between the camera and the measured object, there should be no transparent object, because the reflected light will lead to measurement distortion.

3.6., Heat dissipation suggestions

The shell of the product itself can meet the cooling requirements, without adding additional heat dissipation mode. It is recommended that the installation site be used where there is ventilation convection, metal mounting surface contact with the camera.

4. Electrical characteristics

4.1. Power supply and power consumption

The power supply and power consumption-related parameters of the product X-D1000 are shown as follows:

Table 3. Current parameters and specifications

Average power consumption	12W
average current	0.5A
Standby current	<0.2A
peak point current	5A
working voltage	24V （18~25.2V ）
The main board is electrically connected to the housing	direct contact

4.2. Reliability standards

The relevant parameters of the reliability criteria table for the product X-D1000 are as follows:

Table 4. Reliability standard table

working temperature	-20℃ ~ 60℃
Storage temperature	-40℃ ~ 80℃
levels of protection	IP 67

5. Version upgrade and SDK

5.1. Version upgrade

(1) The version can be upgraded / degraded through the principal machine independently developed by X-Dynamics. For the specific operation, refer to the corresponding version of the principal machine;

(2) After the successful upgrade, the camera needs to be restarted before the new version will take effect. Make sure that the communication mode is stable during the upgrade process, otherwise the upgrade will fail. If the upgrade fails, please restart the camera, wait the camera recognizes normally, then repeat the upgrade operation again.

5.2. SDK Description

Relevant SDK of Windows, Linux and ROS platforms were provided.

Please contact the relevant sales staff for the latest SDK.

Table 5. SDK brief description table

SDK	Provide universal SDK development package, including basic API, example program, help Document, and tool software;
Supported platforms	Support for cross-platform development. Windows/Linux(PC or ARM)/ROS ;

6. Appendix

6.1. System integration guide

Before users choose X-D1000 iTOF camera for development, please contact with the personnel of X-Dynamics to obtain technical specifications, user manual, host computer and other information. Through preliminary evaluation, debugging and inspection other steps to determine whether to meet the requirements of mass production.

After purchasing the X-D1000 camera, users can obtain the SDK package through the X-Dynamics staff. SDK supports multi-platform development of Window, Linux and Android. SDK can output depth, point cloud and other information, users can choose the corresponding development platform according to their own needs for secondary development.

Suggested process:

Read the X-D1000 technical specifications;

Purchase and obtain the X-D1000 prototype through official channels;

Before development, please contact the personnel of X-Dynamics to obtain the user manual and other information;

You can choose the appropriate development platform;

Develop the product according to the function. If any problems are encountered in the development, please contact X-Dynamics in time

Determine the mass production plan of the final product;

Mass produce the final product according to the mass production plan;

6.2. Use tips

- (1) When using the 3D camera, please remove the protective film in front of the lens;
- (2) During installation and use, keep away from the heat source (especially the lens position);
- (3) In the use of 3D camera, please avoid the lens from being scratched by sharp items;
- (4) Avoid frequent use of alcohol (organic solvent) to wipe the surface of the lens, there is a risk of damage to the coating, recommended Wipe with pure velvet cloth;
- (5) In strong high frequency vibration or external shock scenarios, please add appropriate protection conditions for the camera;
- (6) In the harsh environment such as too wet or strong dust, please add appropriate protection conditions for the camera;
- (7), please refer to the 3D camera installation instructions to avoid any installation method that will cause serious deformation of the camera.

6.3. Precautions

- (1) Use the self-purchased cable or cut the supporting cable to connect by yourself, please strictly follow the cable definition in the specification, or the wrong power cord will burn down the camera, or abnormal signal;
- (2) When the 3D camera is used or tested, do not reverse the table or object to prevent it from Overheating of the laser;
- (3) Although the 3D camera has passed the CLASS I certification, it is suggested to avoid the close direct eye contact with lens at work;
- (4) In the process of use, if the image frame rate is insufficient and the flow phenomenon cannot be open, it is recommended to reconnect in the correct way, and ensure that all interfaces have good contact.
- (5) Do not dismantle the camera.