CVBS/ HDCVI / HD -TVI / AHD

Coaxial cable video optical transceiver

User Manual

Product Introduction

The CVBS/ HDCVI / HD -TVI / AHD coaxial cable video optical transceiver adopts a pure hardware, uncompressed design, achieving point-to-point lossless image restoration and zero-delay remote control transmission, ensuring real-time signal transmission and a high-fidelity video transmission system. The equipment uses fiber optic transmission , giving it extremely strong resistance to electromagnetic interference (EMI), radio frequency interference (RFI), and common-ground loop interference. The pure hardware architecture also avoids the risks of software system crashes and viruses, ensuring stable and reliable performance and effectively overcoming the signal attenuation and interference problems in traditional copper cable transmission . Coaxial cable video optical transceivers , as an important component of video surveillance systems , are widely used in smart city, intelligent urban transportation, highway, and urban rail transit projects .

To meet the practical needs of the market and reduce procurement costs, the equipment is designed with series such as 720P/1080P (2MP)/1920P (5MP). The modular and plug-in card design further improves the configurability and maintainability of the system . To meet the needs of more projects, multiple video signals can be integrated into a single fiber without affecting video quality, and more signals can be integrated into a single fiber to reduce fiber optic resources. CWDM technology is used to integrate multiple video signals (1~64 video channels) and various signals (audio, data, telephone, network, and optical signal) into a single fiber for simultaneous transmission , thereby achieving zero-latency, high-fidelity, repeater-free single-mode fiber transmission up to 20KM, with a maximum customized range of 80KM.

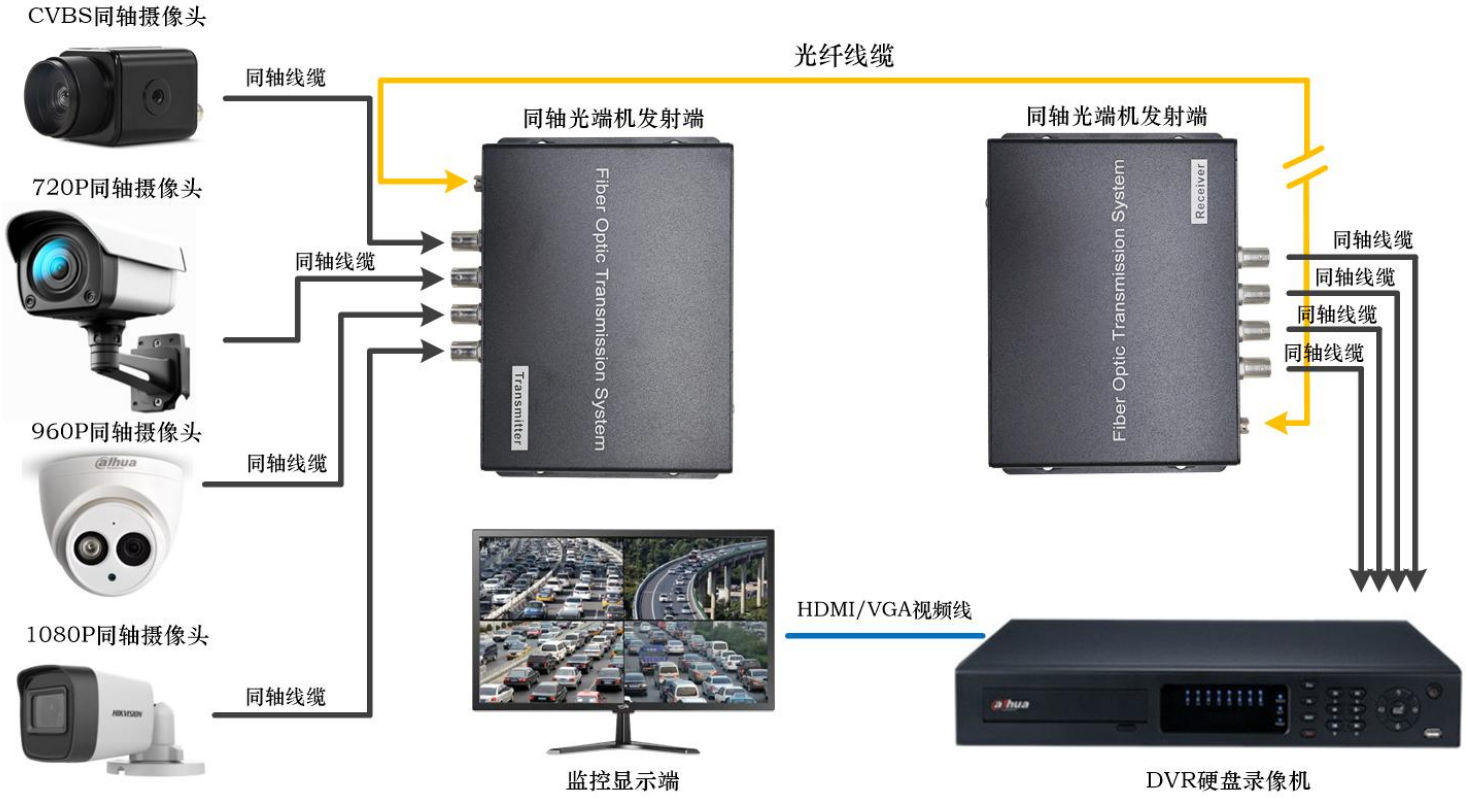
Product Features

- Adopting an FPGA core design scheme , this architecture has strong system flexibility and scalability ;
- Supports 1 to 64 video channels via CWDM technology ;
- Automatically detects input video format, compatible with CVBS (PAL standard) 720×576 (NTSC format 720×480);
- Supports hot-swapping and plug-and-play functionality, facilitating on-site installation, maintenance, and system expansion. ;
- Supports modular design and plug-in card assembly ;
- Numerous status indicator lights provide real-time feedback, helping users quickly identify device status or potential problems ;

- The standard single-mode optical module can achieve a relay-free range of up to 20 kilometers ;
- Industrial-grade design , employing surface mount technology (SMT) and three-level lightning and electrostatic protection ;
- Plug and play, no debugging required;

System connection example (for reference only)

Example: 4-channel forward coaxial 1080P video optical transceiver



LED indicator light function description

Serial Number	Indicator light silkscreen description		Transmitter Function Description	Receiver Function Description
1	PWR	Power indicator light	The light stays on after the power is turned on.	The light stays on after the power is turned on.
2	FIBER	Fiber optic indicator	It will stay lit when it receives reflected light.	It will stay lit when receiving positive light.
3	VIDEO	Video indicator light	The indicator light will stay on when the video source is connected.	The light remains on after receiving the transmitter video source.
4	DATA	Data indicator light	Flashing after receiving data	Flashing after receiving data

Troubleshooting

- The power indicator light is malfunctioning (POWER).

A: Check if the power adapter meets the equipment requirements or if the power adapter is faulty.

Is the power strip not plugged in properly or is it loose?

- Fiber optic indicator light malfunction (FIBER);

A: Check if the fiber optic connector is loose or not properly plugged in.

Check if the fiber optic cable has excessive attenuation.

- The video indicator light (VIDEO) is malfunctioning.

A: Check the signal source

Replace video cable

■ The data indicator light is malfunctioning (DATA).

A: Check the COM port and whether the baud rate is consistent.

Check if the serial cable is connected in reverse.

Product Parameters

Optical parameters							
Fiber wavelength	1310nm & 1470nm-1610nm depending on equipment selection		Fiber optic interface	FC/ST/SC optional	Transmission distance	Single-mode 20km, multi-mode 500km	
Video parameters							
physical interface	BNC	Transmitter input level	>500mVp-p	Receiver output level	1-1.2Vp-p	Video analog bandwidth	20-40 M
Differential phase	⩽ 2°	Differential gain	⩽ 2%	Input and output impedance	75 euros	Sampling bit depth	8-bit
Sampling freq	50MHz-100MHz	Supported resolutio	1280 (H) * 720 (V) / 1920 (H) * 1080 (V) / 2560 (H) * 1960 (V)				

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Data parameters							
baud rate	0~115200bps	Data bits	8-bit	Work mode	Pass-through	physical interface	Phoenix Terminal
Power parameters							
Desktop power supply	DC 5V	Rack-mount power supply	AC100~240V	Overload protection	support		
Environmental indicators							
Operating temperature	-20 ° C ~ +70 ° C	Storage temperature	-40° C ~85° C	relative humidity	5% to 95% (non-condensing)	Working life	>100,000 hours

Product dimensions/packaging/weight/plain opening

Serial Number	Product Name	Body dimensions (unit: cm)	Packaging dimensions (unit: cm)	weight	Optical port selection
1	1-channel video / 1-channel video + data	10.4*10.4*2.8	25*14*7.5 (Correct)	0.75kg	FC/SC/ST
2	4-channel video / 4-channel video + data	16.7 * 11.3 * 2.8	34*25*5.5 (Correct)	1.3kg	FC/SC/ST
3	8-channel video / 8-channel video + data	16.7*11.3*4.4	34*25*5.5 (Correct)	1.65 kg	FC/SC/ST

4	16-channel video / 16-channel video + data	48.3*22*4.4	52.4*34.6*18.1 (Correct)	5kg	FC/SC/ST
5	32-channel video / 32-channel video + data	42.2*23*9	52.4*34.6*18.1 (Taiwan)	6.5kg	FC/SC/ST

Due to product iteration and upgrades, the above data is based on the existing product specifications. The packaging size and weight of the product in the future will be subject to the actual shipment.

Product Selection

Serial Number	Product Model	Product Name	Serial Number	Product Model	Product Name
1	HL-1V-1080P	1-channel 1080P pure video optical transceiver	2	HL-1V1D-1080P	1-channel 1080P video + 1-channel RS485 data optical transceiver
3	HL-8V-720P	8-channel 720P pure video optical transceiver	4	HL-8V1D-720P	8-channel 720P video + 1-channel RS485 data optical transceiver
5	HL-16V-720P	16-channel 720P pure video optical transceiver	6	HL-16V1D-720P	16-channel 720P video + 1-channel RS485 data optical transceiver
7	HL-32V-720P	32-channel 720P pure video optical transceiver	8	HL-32V1D-720P	32-channel 720P video + 1-channel RS485 data optical transceiver
9	HL-4V-1080P	4-channel 1080P pure video optical transceiver	10	HL-4V1D-1080P	4-channel 1080P video + 1-channel RS485 data optical transceiver
11	HL-8V-1080P	8-channel 1080P pure video	12	HL-8V1D-1080P	8-channel 1080P video + 1-channel RS485

		optical transceiver			data optical transceiver
13	HL-16V-1080P	16-channel 1080P pure video optical transceiver	14	HL-16V1D-1080P	16-channel 1080P video + 1-channel RS485 data optical transceiver
15	HL-32V-1080P	32-channel 1080P pure video optical transceiver	16	HL-32V1D-1080P	32-channel 1080P video + 1-channel RS485 data optical transceiver
17	HL-4V-5MP	4-channel 5MP pure video optical transceiver	18	HL-4V1D-5MP	4-channel 5MP video + 1-channel RS485 data optical transceiver
19	HL-8V-5MP	8-channel 5MP pure video optical transceiver	20	HL-8V1D-5MP	8-channel 5MP video + 1-channel RS485 data optical transceiver
twenty one	HL-16V-5MP	16-channel 5MP pure video optical transceiver	twenty two	HL-16V1D-5MP	16-channel 5MP video + 1-channel RS485 data optical transceiver
twenty three	HL-32V-5MP	32-channel 5MP pure video optical transceiver	twenty four	HL-32V1D-5MP	32-channel 5MP video + 1-channel RS485 data optical transceiver

packing list

Serial Number	name	unit	quantity
1	Transmitter with optical module	tower	1
2	The receiver includes an optical module.	tower	1
4	3.81mm male industrial terminal block	piece	2

5	DC 5V power adapter/AC power cord	Taiwan/item	2
6	manual	Book	1
7	Warranty card/certificate of conformity	open	1

PreCautions

- Lightning protection, static electricity protection, waterproofing and grounding:
- We strongly recommend that equipment installers fully consider the impact of lightning strikes on grounding and take appropriate grounding and lightning protection measures. Excessive static electricity can damage the optical components and data chips inside the equipment. It is recommended to disconnect the power supply to the optical transceiver before plugging or unplugging its data ports. The equipment casing is not waterproof; the equipment mounting box should be designed with waterproofing in mind.
- Optical fibers and optical devices:
- The optical components of an optical transceiver are very fragile. Exercise extreme care when plugging or unplugging the fiber optic cable to avoid permanent damage. It is especially important to note that the light emitted by the optical components can cause permanent eye damage; therefore, never look directly at the optical components. When measuring the optical power of the optical transceiver, please use an instrument such as an optical power meter.
- Equipment and installation steps:

(1) Fiber optic installation: After confirming that the fiber optic link meets the installation requirements, carefully insert the fiber optic cable into the fiber optic interface of the optical transceiver.

(2) Equipment installation: When connecting, please pay attention to the silkscreen instructions. The optical transceiver distinguishes between the transmitter and receiver.

(3) It is recommended to use a short fiber optic link for the first time, and ensure that all functions of the equipment are normal before long-distance transmission.