16-way GMSL2 Capture Card A16

Solution for Single Video Capture Card of Multiple Cameras for Auto Pilot Vehicle

AUMO

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Product Introduction：

Capture card A16 for in-vehicle camera GMSL is a single card solution independently developed by ALINX Electronic Technology (Shanghai) Co., Ltd. Only one PCIE3.0 X16 slots is needed to realize video capture of 16-way cameras, and PTP timestamp function is provided to ensure the synchronization of 16-way video data, so it is the best choice for auto pilot vehicle scheme of IPC.

I. Key parameters

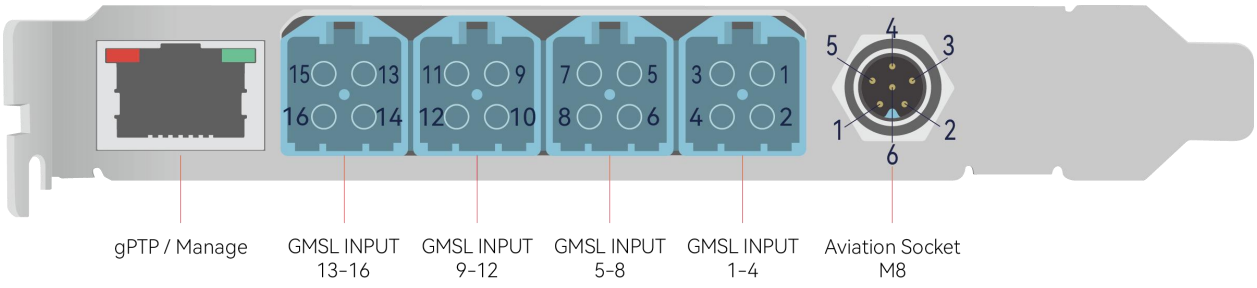
Item	Content	Item	Content
Serializer	Support MAX96705 / MAX9295A / MAX96717F/MAX96717ect.	Deserializer	MAX96712
Input Resolution	1920*1080@30fps support up to 16-way 4096×2160@30fps support up to 8-way	Number of channels	16-way cameras input
Video format	YUV422、RGB888、RAW12	PCIE	PCI Express Gen 3 x16
Cable length	Under GMSL1 mode can reach 40m (3Gbps) Uncle GMSL2 mode can reach 20m (6Gbps)	Website	10/100/1000M Adaptive Support PTP timestamp with time service, with the accuracy of less than 1 ms
POC Power supply	Single channel Max 1A@12V	CAN/CAN-FD	1 way
GPS	Support GPS timing synchronization	External trigger	Support the synchronization of the external trigger of cameras
Upgrade	Support the upgrade of PC firmware	Architecture	Support V4L2 software architecture
I/0 Interface	TTL trigger, GPS	FAKRA	4-in-1 Amphenal Z code min-Fakra
Working temperature	-40℃ ~ 70℃	Storage temperature	-40℃ ~ 85℃
Working Humidity	10%～90%	Storage Humidity	0～90%
Power supply	PCIE Power supply / 12VPower supply	Weight	400g
Size	Length* Width：111.15 * 190（mm）	MTBF	5 years

II. Software parameters:

Item	Content
Host system	The Linux kernel version has tested:： UBuntu16-linux4.15.0-142、UBuntu18-linux5.4.0-144、UBuntu20-linux5.15.0-67
Function Support	Support Linux operating system and be driven with V4L2 framework. Support to connect the peripherals with AXI interfaces, and support to disconnect the peripherals with MSI. Support standard IIC and UART equipment. Support USERPTR and MMAP under the memory mode. Support the camera configuration and query through IIC bus;
Common operations	VIDIOC_DQBUF, VIDIOC_QBUF VIDIOC_STREAMOFF, VIDIOC_STREAMON VIDIOC_REQBUFS, VIDIOC_QUERYBUF VIDIOC_QUERYCAP, VIDIOC_QUERYCTRL VIDIOC_G_PARM，VIDIOC_S_PARM, VIDIOC_G_FMT, VIDIOC_S_FMT VIDIOC_G_CTRL，VIDIOC_S_CTRL

III. Interface description:

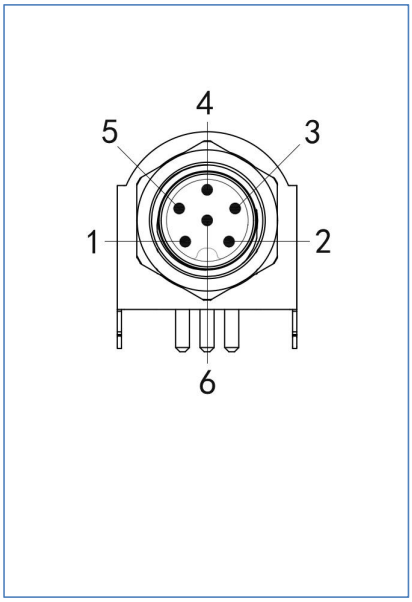
1 Gigabit Ethernet, 4-way 4-in-1 Fakra interfaces (16-way for video capture) and 1 aviation socket M8 are led out at the baffle as the external interfaces.



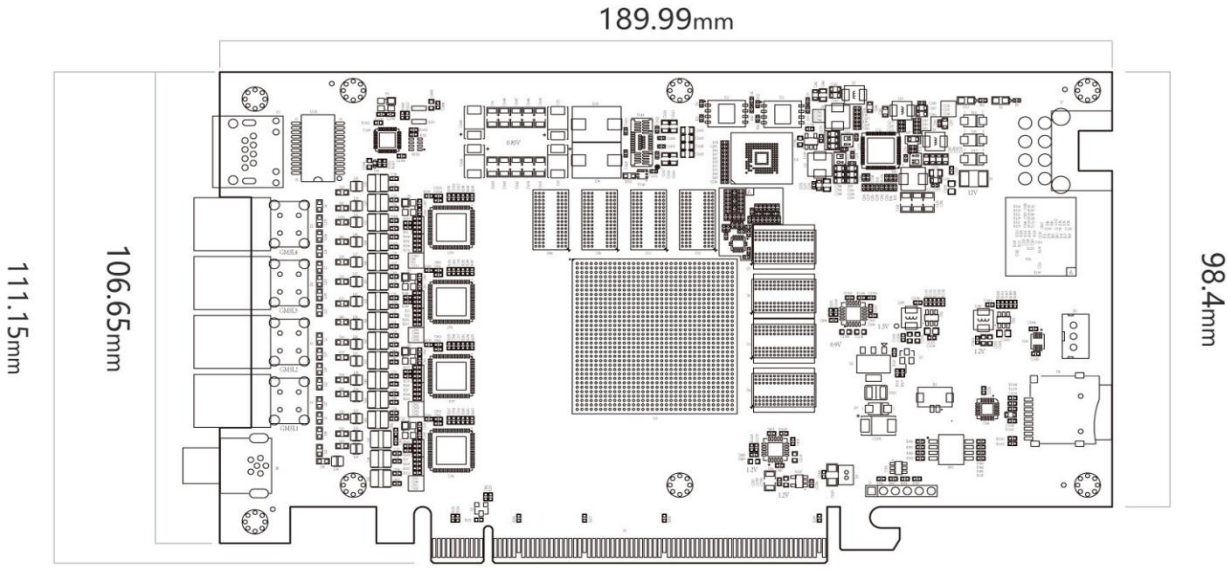
IV. Definition of aviation socket interface:

The aviation socket (public socket) with M8 6 pins is used for GPS communication and external trigger input.

PIN	Signal name	Direction	Description
1	FPGA_TRIG	Input	The external cameras are synchronously triggered
2	GPS_PPS	Input	GPS PPS Synchronous input
3	GPS_RXD	Input	GPS Serial communication RXD，TTL Level
4	GPS_TXD	Output	GPS Serial communication TXD，TTL Level
5	GND	-	For reference
6	GPS Power	Output	The output value is 3.3 V by default, support 5 V (optional)



V. Size and Structure:

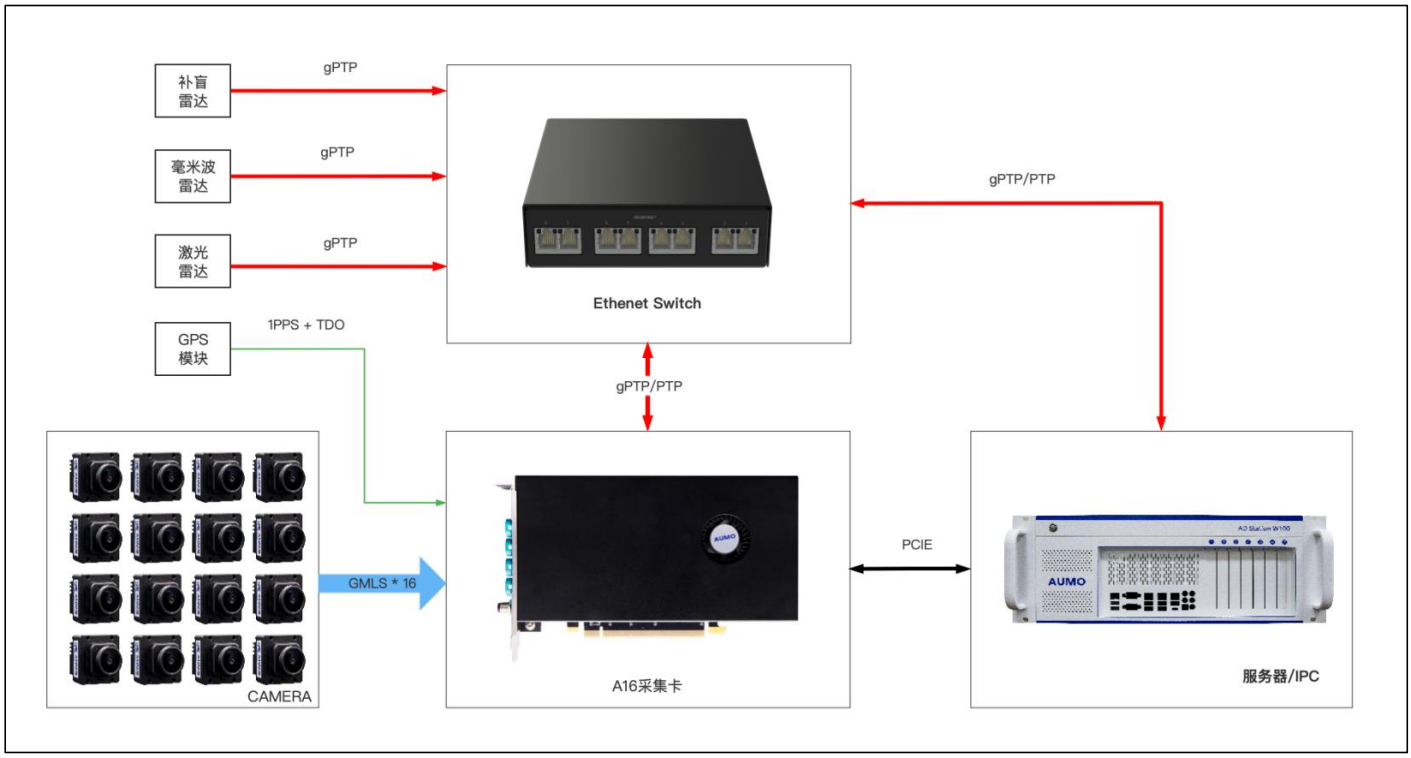


VI. Power consumption test:

Item	Power Consumption（W）	Remark
Static power consumption	16.43	The camera module is not accessed
Dynamic power consumption	47.75	Accessed 16 camera modules

VII. Typical cases:

Scheme of capture and calculation platform for autonomous vehicles



Version control:

Version	Time	Description
1.0	2023/3/30	Initial version
1.1	2023/5/17	Update "III. Interface Description" and "V. Fakra Interface Definition"
1.2	2023/11/15	Update "3, interface description", remove "5, Fakra interface definition"