ADVANTECH

ICAM-520/500 Series Smart Camera Startup Manual

Packing List

Before installation, please ensure that the following items have been included in your shipment:

1. ICAM-520/500 smart camera x 1
2. Startup manual x 1

If any of the above items are missing or damaged, contact your distributor or sales representative immediately.

Caution: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Attention: DANGER D'EXPLOSION SI LA BATTERIE EST INEXACTEMENT REMPLACÉE. REMPLACEZ SEULEMENT AVEC LA MÊME CHOSE OU LE TYPE ÉQUIVALENT RECOMMANDÉ PAR LE FABRICANT, JETTENT LES BATTERIES UTILISÉES INSTRUCTIONS DE S SELON FABRICANT DES'.

For more information on this and other Advantech products, please visit our website at

http://www.advantech.com

For technical support services, please visit our support website at

http://support.advantech.com

This manual is for the the ICAM-500/520.

Part No. 204V050000 Edition 1
Printed in Taiwan December 2022

Specifications

Sensor

- SONY IMX296, 1.6MP @ 60fps , Global shutter, Monochrome/Color

Processor

- ICAM-520:
  NVIDIA Xavier NX
  6-core NVIDA Camel ARM® v8.2 64-bit
  CPU: 6MB L2 + 4MB l3 (Max. operating frequency: 1.9GHz)
  GPU: 384-core NVIDIA Volta GPU with 48 Tensor
- ICAM-500:
  NVIDIA Jetson Nano
  CPU: Quad Core ARM Cortex A57 (Max. operating frequency: 1.43GHz)
  GPU: Maxwell GPU, 128 CUDA core, performance up to 512 GFLOPS (FP16)

Image Signal Processor

- **Mono:** Brightness, Sharpness, Dark noise correction (Default enable)
- **Color:** Brightness, Color debayering, Sharpness, Auto with balance and CCM

Memory, Storage

- ICAM-520:
  NVIDIA Xavier NX
  8 GB LPDDR4/16GB eMMC
- ICAM-500
  NVIDIA Jetson Nano
  4 GB LPDDR4/16GB eMMC

Optical

- **12 mm variable focal length:**
  FOV 40 x 29.3 mm @ 100 mm working distance
  FOV 364.5 x 263.7 @ 900 mm working distance
- **16mm variable focal length:**
  FOV 33.9 x 25.3 mm @ 100 mm working distance
  FOV 305.4 x 228.2 @ 900 mm working distance
- **LED illumination:**
  8 x PWM white/red LEDs, programmable

Synchronization

- Hardware Trigger/software Trigger/free-run

Specifications (Cont.)

I/O

- 1 x USB 3.0, Type-C connector (Only works for Keyboard & mouse. Connect to USB storage will increase power consumption and heat the system)
- 1 x Micro USB for OTG (Only works in engineering mode)
- 1 x RS485
- 2 x Digital Input
- 2 x Digital Output
- 1 x Trigger Input
- 1 x Micro SD card slot

Display

- 1 x HDMI

LAN

- 1 x 10/100/1000 Base-T

Power Requirements

- ICAM-520: 19~24V_{DC} Max 18W, typical 15W
- ICAM-500: 19~24V_{DC} Max 17W, typical 15W

***The power related design of ICAM-520 is up to the power mode 2(15W, 6 core CPU). The power mode (mode 6,7,8) may causes Jetson Platform throttling. For more information, please refer https://docs.nvidia.com/jetson/archives/l4t-archived/l4t-3271/index.html#page/Tegra%20Linux%20Driver%20Package%20Development%20Guide/power_management_jetson_xavier.html#wwpID0E0GG0HAJetson Linux.

Dimension

- ICAM-520: 82 mm (W) x 123 mm(H) x 62.9 mm (D)
- ICAM-500: 82 mm (W) x 123 mm (H) x 59.9mm (D)

Software Package

- **OS:**
  - ICAM-520: Linux Ubuntu 18.04, Jetpack 4.6.2
  - ICAM-500: Linux Ubuntu 18.04, Jetpack 4.5.1
- **SDK/Utility:** CAMNavi SDK, Web based camera utility, IP configure tool, NVIDIA DeepStream SDK & example

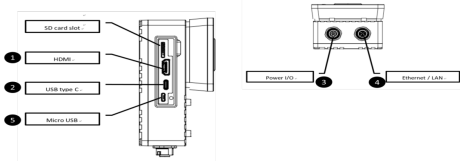
Environment

- **Operating temperature:** 0 ~ 45° C
- **Vibration during operation:** 5 Grms
- **EMC:** CE, FCC

Connector

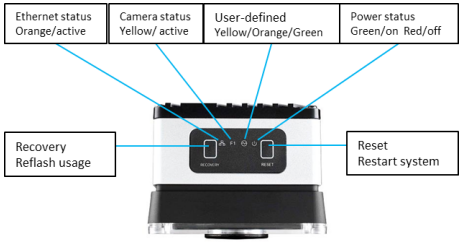
The ICAM-520/500 series has followings connectors that allow you to configure your system for your application. ICAM will be power on without push any button. The following table lists the functions of the connectors.

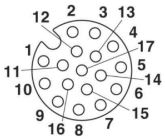
Please connect the ICAM with power connectors first before power on.



Power, Trigger input, Digital I/O and RS485 Connector

Connector (Cont.)



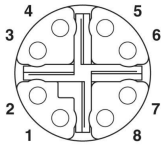


Pin	Pigtail	Description	Remark
1	Brown	COM, RS232 TX	No use
2	Blue	COM, RS232 RX	No use
3	White	COM, RS485 D+	
4	Green	COM, RS485 D-	
5	Pink	System power in GND Vin(-)	
6	Yellow	System power in GND Vin(-)	No use
7	Black	DI/DO GND	
8	Gray	Digital input 0	
9	Red	Digital input 1	
10	Violet	Digital output 0	
11	Gray/ Pink	Digital output 1	
12	Red/ Blue	No use	
13	White/ Green	System power in Vin(+)24V	
14	Brown/ Green	System power in Vin(+)24V	No use
15	White/ Yellow	Rest system BTN	To reset the system via closed to GND (Pin 17)
16	Yellow/ Brown	Hardware trigger in	
17	White/ Gray	GND	

Ethernet/LAN

Ethernet Connector (LAN)

ICAM-520/500 series is equipped with one Ethernet port provides a M12 connector.



Pin	Signal
1	MDI_0_P
2	MDI_0_N
3	MDI_1_P
4	MDI_1_N
5	MDI_3_P
6	MDI_3_N
7	MDI_2_N
8	MDI_2_P

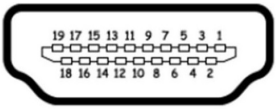
Micro USB

Only for engineering mode usage

Pin	Signal
1	Vbus (4.4-5.25V)
2	D-
3	D+
4	ID
5	GND

Display

HDMI



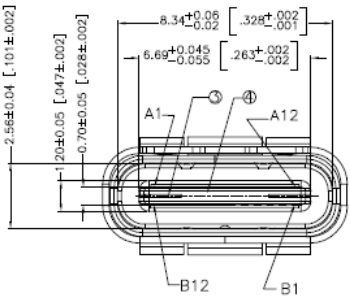
Pin	Signal	Pin	Signal
1	TMDS data 2+	11	TMDS clock shield
2	TMDS data 2 shield	12	TMDS clock-
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	No connected
5	TMDS data 1 shield	15	DDC clock

Connections (Cont.)

6	TMDS data 1-	16	DDC data
7	TMDS data 0+	17	Ground
8	TMDS data 0 shield	18	+5V power
9	TMDS data 0-	19	Hot plug detect
10	TMDS clock+		

USB type C connector

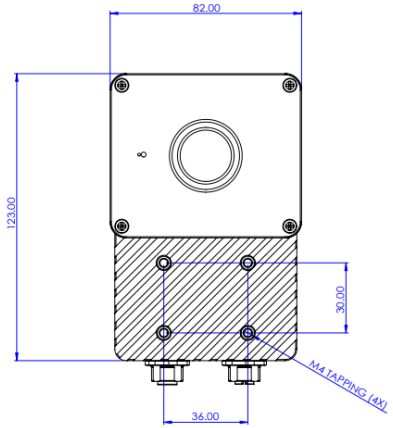
Only for USB Hub connect to keyboard & mouse usage, Connect to USB storage will increase the power consumption and will heat the system. Please refer to the table below for pin assignments.

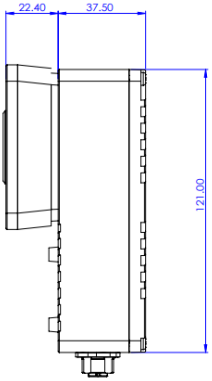


Pin	Signal	Pin	Signal
A1	GND	B1	GND
A2	SSTXp1	B2	SSTXp1
A3	SSTXn1	B3	SSTXn1
A4	VBUS	B4	VBUS
A5	CC1	B5	SBU2
A6	Dp1	B6	Dn2
A7	Dn1	B7	Dp2
A8	SBU1	B8	CC2
A9	VBUS	B9	VBUS
A10	SSRXn2	B10	SSTXn2
A11	SSRXp2	B11	SSTXp2
A12	GND	B12	GND

System Dimensions

ICAM-500





ICAM-520