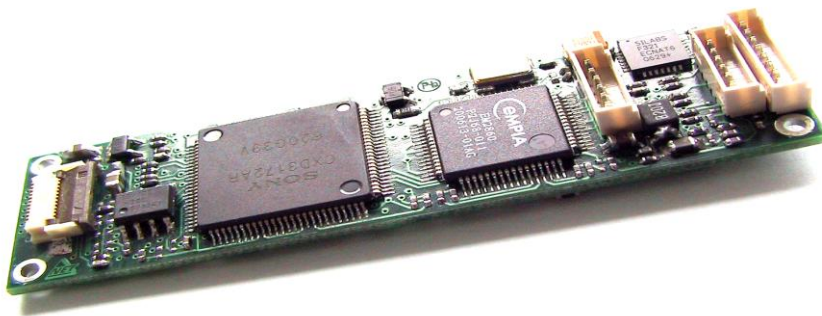


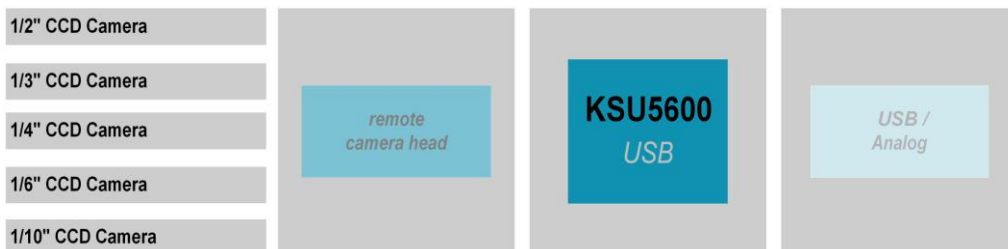
KSU5600 *USB*

10 bit Digital 1-CCD USB Color Video Camera Controller



The KSU5600 USB is a video camera controller for 1/2" / 1/3" / 1/4" 1/6" 1/10" CCD OEM remote camera heads. It is designed to be used in a wide variety of professional medical, industrial and security applications.

It is a very economical video solution and designed for easy integration in custom systems.



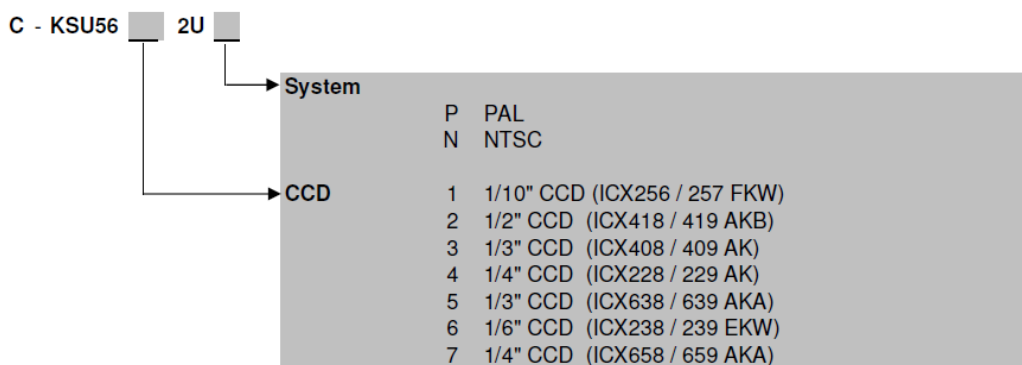
Features:

- Compatible to SONY CCD image sensor 1/2", 1/3", 1/4", 1/6", 1/10"
- for remote head up to 15 m
- Digital Signal Processor (DSP)
- 10bit ADC
- Pixel synchron native transfer / complete digital chain
- size 65 mm x 19 mm
- Static & Dynamic detection, maximum 32 points
- ALC function (AGC / ELC)
- White Balance Auto / Hold / Manual
- Shutter speed up to 1/10.000 sec Auto / Manual
- Mirror Function
- USB2.0 Digital Video Out (BT656) (Vista / XP recommended)
- Video output CVBS and Y/C
- Pixel detection and compensation
- All camera parameters software adjustable (USB2.0)

Application:

- Medical imaging (Dental, Endoscopy, Dermatology, Ophthalmology, Otokoscopy)
- Security Technology
- Quality inspection
- Automation and quality assurance
- Visualization and microscopy
- Image processing
- Factory automation

Nomenclature *KSU5600 OEM series:*



KSU5600 USB models:

<i>compact camera version</i>	KSU56x2UP	KSU56x2UN
TV system	PAL	NTSC
CCD type	1/2", 1/3", 1/4", 1/6" and 1/10" from Sony	
Active Pixel	752 (H) x 582 (V) (1/10" CCD 500 (H) x 582 (V))	768 (H) x 494 (V) (1/10" CCD 510 (H) x 492 (V))
Scanning Lines	625	525
Total pixel	2:1 interlaced	
Sync System	internal	
Resolution (Hor.)	460 TV lines (1/10" CCD 320 TV lines)	460 TV lines (1/10" CCD 330 TV lines)
Resolution (Vert.)	420 TV lines	350 TV lines
Scanning frequency (Vert.)	50Hz	60Hz
Scanning frequency (Hor.)	15,625 kHz	15,734 kHz
Aspect ratio	4:3	
Illumination (1/2" CCD)	Minimum: 0,8Lux, F1.2 (AGC ON), approx. 50% Video level	
Digital Video output	USB 2.0 (YUV 4:2:2)	
Signal/noise ratio (SNR)	>56dBp-p/rms (digital)	
Electronic Shutter	Auto / Manual selectable Maximum shutter speed 1/10.000 sec.	
Gamma	adjustable via Software	
Automatic Gain Control (AGC)	ON/OFF 0~18dB adjustable	
White balance	One Push/3000K-6000K	
Camera parameters	adjustable via USB 2.0	
Power supply	stabilized DC 5V (not over USB port) (+0,2V) on J2	
Power consumption	~ 650 mA	
Environmental condition	Temperature: 0° to 50°C Humidity: max. 95%	
External dimension	65 x 19mm	
Weight	approx. 6 g	

1/2" remote camera head version for (ICX 418/419 AKB)

Camera name	KSU5622UP	KSU5622UN
Order-No.	0202910000	<i>on request</i>

1/3" remote camera head version for (ICX 408/409 AK)

Camera name	KSU5632UP	KSU5632UN
Order-No.	0202650000	0202670000

1/3" remote camera head version for (ICX 638/639 AKA)

Camera name	KSU5652UP	KSU5652UN
Order-No.	on request	on request

1/4" remote camera head version for (ICX 228/229 AK)

Camera name	KSU5642UP	KSU5642UN
Order-No.	0202750000	0202790000

1/4" remote camera head version for (ICX 658/659 AKA)

Camera name	KSU5672UP	KSU5672UN
Order-No.	on request	on request

1/6" remote camera head version for (ICX 238/239 EKW)

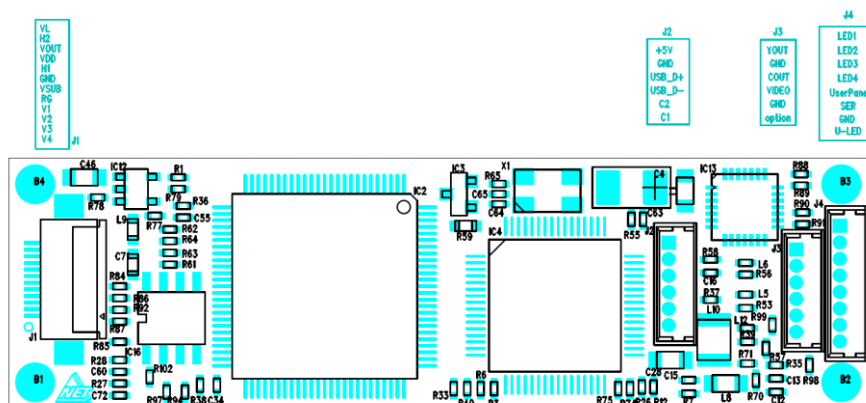
Camera name	KSU5662UP	KSU5662UN
Order-No.	0202560000	0202440000

1/10" remote camera head version for (ICX 256/257 FKW)

Camera name	KSU5612UP	KSU5612UN
Order-No.	0202320000	0202410000

Connector position:

KSU5600 USB

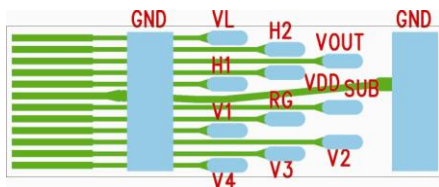


Pin	J1 remote camera head
1	V4
2	V3
3	V2
4	V1
5	RG
6	Vsub
7	GND
8	H1
9	VDD
10	Vout
11	H2
12	VL

No " Hot-Plug " function !!

If a new remote camera head will be plugged to the camera unit, the camera have to be powerless, otherwise the CCD will be damaged.

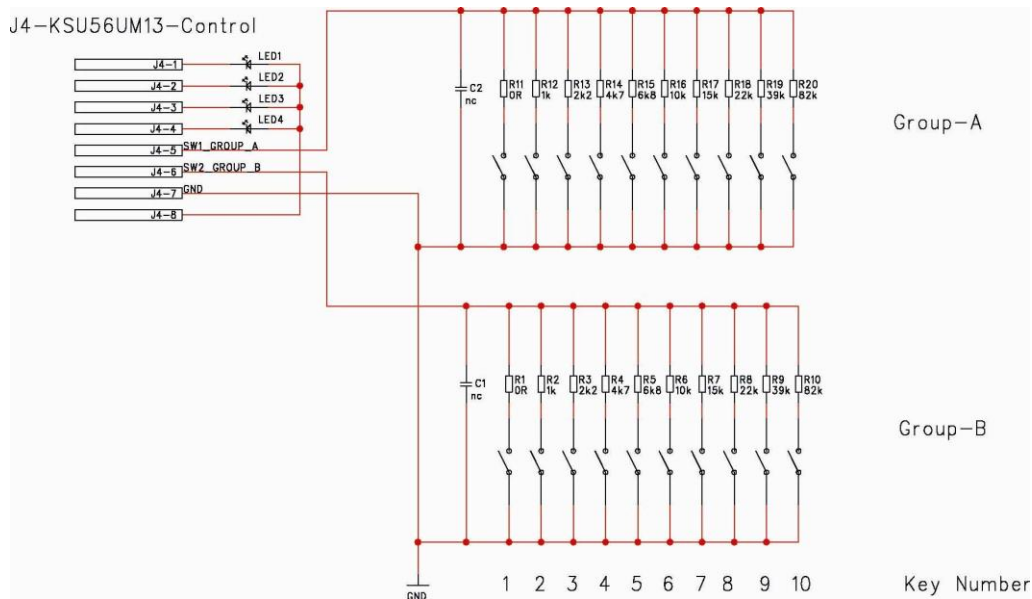
flex PCB for J1 (optional available)



Pin	J2 USB / Power	J3 Video out
1	+5V DC (500mA) Power in	Analog Y-Out
2	GND Power in	Analog GND
3	USB Data +	Analog C-Out
4	USB Data -	Analog CVBS-Out
5	service	Analog GND
6	service	Option

-- external power supply necessary (not over USB port) --

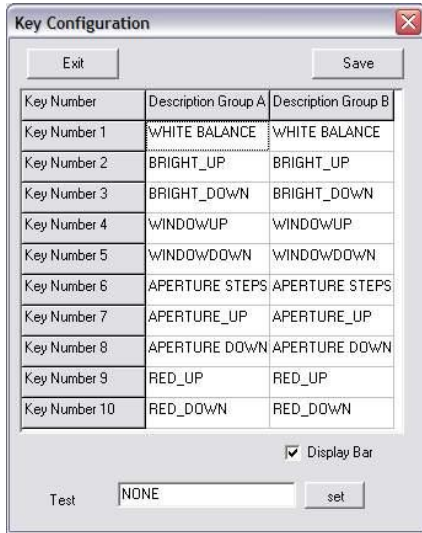
Pin	J4 LED
1	LED 1
2	LED 2
3	LED 3
4	LED 4
5	SW1 GROUP A
6	SW2 GROUP B
7	GND
8	U-LED



Key-Configuration

SW1 (GroupA) and SW2 (GroupB):

SW1 and SW2 can be used for special control functions and can be set with the KSU5600 ADJ software / Button « Key Configuration »



For example :

- White Balance
- Brightness up and down
- Window size up and down
- PC control functions for **API** service

Configuration for PC control functions (API service):

SW 1: Key Number 1 / Description Group A => PC function 7

SW 2: Key Number 1 / Description Group B => PC function 8

Possible Functions for Control :

AGC :

With this function the AGC maximum gain can be switched between two types.
The AGCmax High and AGCmax Low setting value are adjusted by the NET KSU5600Adj Software.

ELC ON/OFF :

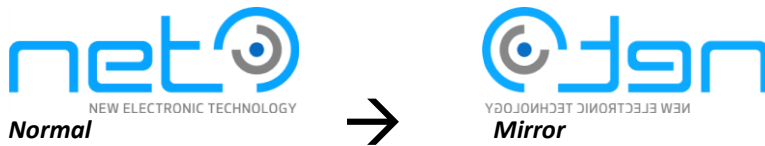
The KSU5600 USB camera offers an ELC function. This ELC mode can be switched ON and OFF.

- ON : Automatic shutter and AGC
- OFF : Manual shutter (fix 1/50 or 1/60) and AGC

Mirror :

The video signal which reversed right and left as shown in the following figure can be output by using the mirror function.

Note : It has no top / bottom reversal function. This is optional available with switch1 or 2.



AWB Run (Push) / Lock (Hold):

Operation is performed in Run mode while the button is pressed and shifts to hold mode when the button is released, allowing the white balance gain at that point to be written to the EEPROM.

When operation shifts from Run to Lock mode, white balance control is stopped and the gain value is held in the condition before the mode transition.

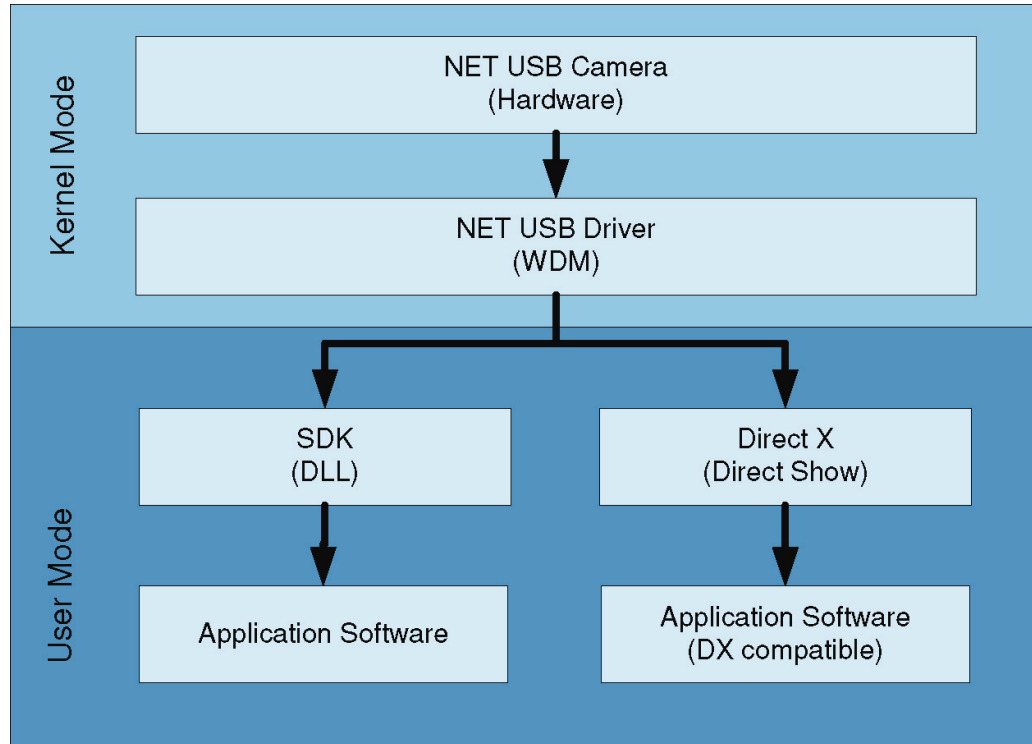
Run mode has no operation frame or other limitations, and performs correction so that the R :G :B evaluation value is always 1 :1 :1

These are standard functions and configurations.

On J5 (KSU5600 USB) different function configurations can be performed by the NET KSU5600Adj adjustment software.

If an other function is needed please request NET.

Modular KSU5600 USB concept:



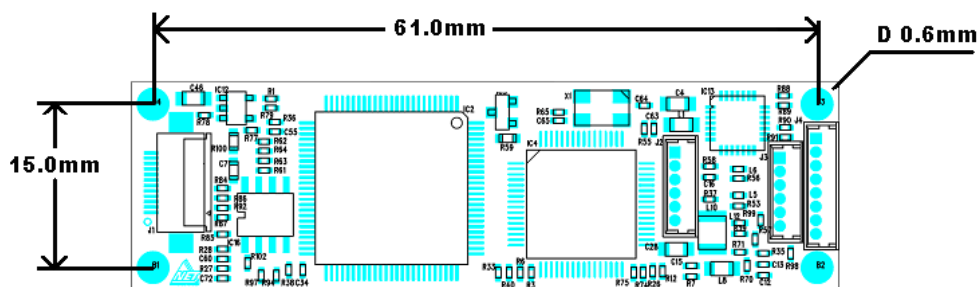
KSU5600 USB

Please note that all data and illustrations are not binding and are subject to error, change and omissions without notice.

Dimensions:

65 x 19mm

mounting point :



Rev. 1.07 / 07-2014

Accessories:

Cable

- 6pin. Molex - open end (for J2 / J3) (Order-no. 0607360000)
- 8pin. Molex - open end (for J4) (Order-no. 0607800000)
- 2m USB cable (Typ A – Typ Mini B) (Order-no. 0606140000)
- 3m USB cable (Typ A – Typ Mini B) (Order-no. 0606130000)

Evaluation Kit

- for KSU5600 USB (Order-no. 0500380000)
 - without remote camera head
 - incl.
 - Keyboard KB600-03 (for J4)
 - KB600-03 cable (for J4)
 - RP5600 / Analog Video out PCB (S-Video and BNC connector / for J3)
 - Video out cable (for J3) for Analog Video out PCB
 - USB cable (Typ A – 6pin Molex) 2.5m (for J2)
- 1/10 remote camera head simulator (Order-no. *on request*)
for 510h resolution

Accessories

- Flex PCB CO-KSU56FL10 for J1 (Order-no. 5100370000)
- CO- KSU56CSL10 PCB incl.Lemo ECG.2B.319.CLN (Order-no. 5100440000)

Remote camera head

- 1/2 camera head (Order-no. *on request*)
- 1/3 camera head (Order-no. *on request*)
- 1/4 camera head (Order-no. *on request*)
- 1/6 camera head (Order-no. 0305080000)
 - cable 3m / \varnothing 3.3mm
 - incl. Flex PCB CO-KSU56FL10 for J1
- 1/10 camera head (Order-no. *on request*)

PC Software & Driver: (Software Download: www.net-gmbh.com)

Driver

- USB NET Driver

Viewer Software

- FrameGrab / USB Cam Sample Software (Demo Application SW)
- Viewer Software

Adjustment Software

- NET KSU5600Adj Software (via USB 2.0)

SDK (API)

- Borland C
- Visual C

System Requirements :

- PC System with 2,0 GHz, 256 MB RAM
- Windows XP SP2, Windows Vista, Windows 7 Pro/Ultimate (32-bit/64-bit), Windows 8 Pro (32-bit/64-bit)
- DirectX 9.0
- USB 2.0 interface

Design and Specifications are subject to change without notice.